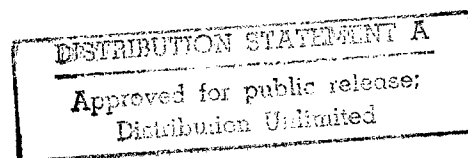




JPRS Report



Science & Technology

***Europe
Economic Competitiveness***

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Europe

Economic Competitiveness

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27 June 1991

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S&T POLICY

Changes Called For in EC Research, Industrial Policies

91WS0331A Paris L'USINE NOUVELLE in French
4 Apr 91 p 38

[Article by Dominique Commiot and Gerard Dubois: "Brussels Turns to Manufacturers: First Step Toward a European Industrial Policy"; first paragraph is L'USINE NOUVELLE introduction]

[Text] A cumbersome Euro-technocracy is getting nowhere on the problem. It is time to get back to production, thus to cooperation between manufacturers. But troubled enterprises must be bolstered up...

The timing was ironic: On the eve of the news that Bull had lost 6.8 billion French francs [Fr], the European Commission announced its intention to give strong support to the troubled electronics and computer industries. Even though the declaration is a first step toward defining a European industrial policy, Brussels does not really have much to show for its ponderous deliberations of the last 15 months.

The report, presented by Filippo Maria Pandolfi, the commission's vice president for research, was notably short on specifics. A certain reluctance to leave the starting gate could be discerned, especially in light of Pandolfi's announcement a week earlier that the commission intends to discard the entire approval procedure for the Community R&D Framework Program (PCRD). Power struggles between the EEC Council of Ministers and the European Parliament have led to this serious impasse.

With a 1990-1994 funding level of Fr40 billion—40 percent of it for the electronics and computer fields—this third framework program, already a year behind schedule, may not get under way before early 1992. And the delays may force the interruption of already ongoing projects.

It is a bitter blow to European R&D. It is clear that the Esprit program for the computer and electronics industries—to which nearly half of all PCRD credits are committed—has failed to arrest the deterioration in trade balance or the foundering of the top European companies in these sectors. Everyone now agrees: The entire philosophy of the framework program needs to be recast.

Identification of research subjects and determination of funding levels by Brussels technocrats, the small size of projects, the necessity of splitting them up among all the member countries, and Brussels' well-known procedural cumbersomeness have limited PCRD's effectiveness. But what is most threatened today is pre-competitive research. Too removed from the marketplace, Esprit has not led to enough advances like the Supernode parallel-architecture computer built by the Alsatian firm Telsat.

Market Orientation

These shortcomings weigh particularly heavy on the computer industry, where concentrated effort is required, given the volume of investment needed and the rapidity of technological change.

In other sectors, PCRD's record is better. For example, the work on nuclear fusion could become a source of clean and virtually unlimited energy. With the Joint European Torus, Europe is now among the world leaders in this branch of research. Likewise, 60 percent of the manufacturers involved in the Brite program (for production technologies) expect commercial benefits within the next five years.

PCRD also has the virtue of acquainting engineers at Thomson, Bull and Alcatel-Alsthom with the latest developments at the Siemens, ICL and Philips laboratories. And the PCRD's "Science and Human Capital Program" is orchestrating graduate-student exchanges on a massive scale throughout Europe. A community of European industrial researchers is being created. That is no mean accomplishment.

But what is at stake right now is the survival of entire segments of European industry. And not just in the computer sector. The relatively small amount of money that automobile builders are investing in research and development—considerably less than what the Japanese spend—augurs poorly for the future. This sector represents about 10 percent of all European value-added, yet it gets less than 2 percent of the community's research appropriations.

Everyone agrees—industrial leaders, governments and European commissioners—that industrial cooperation is essential. But how to make it a reality? Sectoral programs launched from the top by the public authorities, such as the French plans for machine-tooling and components, have demonstrated their ineffectiveness. Cooperation in pre-competitive research has also shown its limitations.

Must we agree with Leon Brittan, the ultraconservative British commissioner, that there is nothing to do but leave everything to market forces? After all, General Motors, Ford and Chrysler need no outside help to mount joint research efforts such as the recently launched project on reduction of automobile emissions pollutants.

The commission has finally agreed to assume its responsibility for development of an industrial policy. But—as always in Brussels—internal debates have resulted in a delicate compromise between the British and Dutch proponents of free enterprise and those—like German commissioner Martin Bangemann and France's Jean-Michel Carpentier—who really support an industrial policy.

The EEC proposes five lines of action: stimulation of demand through large contracts, development of European technologies, accelerated training of specialists, a

joint commercial policy for exports, and improvement of conditions for industry. Brussels thus accepts the idea of supporting joint development of products and seems to be turning away from research subjects imposed from on high. The commission also insists on the fact that "manufacturers must take responsibility for establishing clear and precise strategic objectives."

Concentrating Efforts

Given the size of the investments to be made, they cannot be dispersed in a sort of community-wide CNRS [National Scientific Research Center]; they must focus on the concrete. And it is up to industry to chart its course. That is what needs to be done, for example, with regard to all-digital television. But is everyone waiting for Brussels to put the train on the track?

The Eureka program is a better example. Proposed by France in 1985 and actively supported by the big European industrial groups, it has brought forth two very concrete programs in domains vital to the EEC: the Jessi program for components (Fr27 billion over eight years) and the European HDTV [high-definition television] program.

So the commission can make recommendations. Looking ahead, however, it must also question its own attitudes, beginning with that timorousness which it criticizes in industry but which it sometimes itself manifests. A certain "angelism" [morbidity desire for incorporeality], as Jacques Calvet would call it. This is especially true with regard to its spinelessness vis-a-vis American and Japanese protectionism, even while it acknowledges their reality. In Europe, meanwhile, it tries to hunt down and suppress anything that smacks even vaguely of protectionism.

The commission has refused to adopt any kind of "Buy European" act, which in public-sector contracts would give preference to EEC manufacturers, all else being equal. That would certainly represent a shot in the arm for Bull, Siemens and Olivetti. It would also punish states that give aid to their "standard-bearers."

Restructuring

On the one hand, the commission pleads for closer cooperation between manufacturers, thus discouraging the policy of national "standard-bearers," while on the other hand it whittles away at their chances to make a recovery. In the electronics domain, the European groups are very poorly positioned, with Bull and (to lesser degree) Olivetti and Nixdorf (Siemens) in computers; Thomson in consumer electronics; Siemens, Philips and Thomson in components. Under pressure to make massive investments, these groups need to restructure themselves before planning cooperative ventures. The blind don't marry the lame.

Finally, the inflexibility Brussels shows with regard to government-provided aid is not always apparent in other domains. For example, after having decided in 1986 to

make D2Mac (the intermediate HDTV standard selected by the EEC) mandatory for satellite broadcasting, Brussels now is suddenly wavering. According to a favorite maxim of commission president Jacques Delors, "you can't have your cake and eat it too." Choices will have to be made.

Research Funds

The Fr40 billion endowment of the EEC's PCRD represents only 4 percent of all the civilian R&D outlays made by the Twelve, and just 3 percent of the EEC budget. But European research, through its involvement in Eureka and the [European] Space Agency, extends beyond EEC borders.

The EEC framework program for 1990-1994 is divided into six compartments: computers and electronics (40 percent of the total), manufacturing and materials technologies (15 percent), energy (14 percent), life sciences and technologies (13 percent), training and mobility for researchers (9 percent), and environment (9 percent). France is contributing to the tune of about 20 percent.

The Eureka program involves some 19 countries, and 2,000 enterprises and research centers are participating in the 400 projects now under way. Since 1986, Fr70 billion has been poured into it, about 40 percent of it by France.

The European Space Agency, with 13 member countries, has a budget of Fr17 billion this year, with France footing 29 percent of the bill. Between now and 2001, France is expected to contribute some Fr82 billion toward the Ariane V rocket, the Hermes aircraft and the Columbus stations.

Japan's Use of Western Basic Research Seen as 'Threat'

*91WS0389A Landsberg PRODUKTION in German
21 Mar 91 p 4*

[Article: "Research in the Sights"]

[Text] FRANKFURT(ai)—Japan's industrial strength is not based solely on its low costs of production, but also on the patents obtained from the more intensive basic research done in the West. Now the Miti (Japanese Ministry of International Trade and Industry) appears decided to intensify basic research in its own country and to search out international cooperation there.

The time when Japanese products could be considered cheap copies of Western goods are long since gone. It is indisputable that their quality standards now match those of the West. It is also indisputable that this, to a considerable degree, has only become possible through their aggressive use of American and European patents. Recently, reports to the effect that Japanese companies want 'to do business' with German scientific establishments have multiplied. Will German industry's classical

advantage, namely, a lead provided by its scientific knowledge, be threatened by a Japanese 'scientific offensive'?

For VDMA (Association of German Machine and Plant Construction) president Dr. Berthold Leibinger, it is a threat to be taken very seriously. "It would be tragic," the VDMA head said, "if we took over basic research with our tax revenues, and the third-party resources to be solicited from the universities and research institutes were used to destroy our industrial base in the long run."

Even if this assessment has to be qualified somewhat—after all the VDMA president as the representative of the interests of the German machine and plant builders is not impartial—his reproach is essentially irrefutable. Numerous Japanese companies admit right out that they have used and continue to make use of Western basic research, and consider it legal to do so on the basis of their business principles.

To date there has been no internationally recognized legal machinery to prevent this practice effectively. All attempts to amend international patent law have failed so far. The displeasure of the West has in the meantime led to sharp economic policy differences, and to putting quotas on Japanese imports.

A venture of the Miti could defuse the situation. This undertaking would entail the promotion of basic research in their own country while at the same time encouraging international cooperation in specific research fields. Improved international cooperation, according to the Miti, should protect Japan against accusations of unfair use of the results of Western research.

Japanese Manufacturers Reinforce Presence in Europe

91AN0373 Brussels *EUROPE in English* 4 Apr 91 p 17

[Text] At the end of January, the number of production operations by Japanese manufacturing companies in 18 European countries (Community and EFTA [European Free Trade Association]) rose to 676, 187 of which were in Great Britain, 122 in France, 109 in Germany, 64 in Spain and 39 in Italy, according to the seventh survey of the Japan External Trade Organisation (JETRO). A total of 147 firms were added to the ranks of Japanese makers based in Europe during the 12-month survey period. Reasons cited for makers' continuing advance into Europe included intensifying competition with European, American and Japanese firms, market expansion, and the changing makeup of the European market. The survey revealed several general strategies taken in regard to the unification of the EC market. These include localising manufacturing and management, unifying European production, marketing, funds procurement and R&D operations, and setting up European centres for design and R&D. Japanese firms place considerable importance on the central coordination of these operations.

In response to demands for greater local content, Japanese parts makers are increasingly setting up operations in Europe. During the period surveyed, for example, electric and electronic machinery parts makers operating in Europe increased from 53 to 67 and transportation machinery parts makers increased from 24 to 44. Japanese manufacturers also stepped up their presence on the European market, enabling local content to reach 88.9 percent in 1990. Procurement levels were reported to be especially high among firms that started operating in 1989 and 1990.

Also, the launch of research centres is a growing trend with Japanese firms in Europe. The importance of these centres was underlined by 77 percent of the firms taking part in the survey. In one year, the number of design and R&D centres rose from 73 to 140, 96 of which are linked to production units.

Japanese firms are hiring European executives and developing relations with local business circles. In 67 percent of cases, Europeans participate in the management team and for every one firm out of three the top executives are European.

Decision-making authority has been delegated—in one form or another—in 83 percent of the companies surveyed. It concerns, in particular, staffing, setting working conditions and wages, procuring materials, and planning production and sales. Virtually all of the respondents indicated that the European office is in control of the local production facilities.

EC Regulates Japanese EPROM Importation

Decision Published

91AN0324A Brussels *EUROPE in English* 13 Mar 91 p 6

[Article: "EEC-Japan: The Import Regime of EPROM Microcircuits Comes Into Force"]

[Text] Brussels (Agence Europe)—In the OFFICIAL JOURNAL OF THE EUROPEAN COMMUNITIES of 12 March 1991, the Council and the European Commission published the ruling and the decision that determine the import regime of the EPROM (erasable programmable read-only memories) electronic microcircuits. The Commission's decision accepts the price commitments of the Japanese exporters (fixing minimum prices by the density of the different EPROM types); the Council ruling introduces an anti-dumping tax of 94 percent on imports which could be effected outside the price commitments (grey market). Given the similar arrangement in application since last year on the import of DRAM (dynamic random access memory) microcircuits, it is for the whole of the market of these fundamental products for the economy that the EEC has introduced clarity and stability.

Regulation Detailed

91AN0324B Brussels EUROPE in English 21 Feb 91
pp 11-12

[Article: "EC-Japan: The European Commission Intends To Regulate Imports of "EPROM" by Accepting the Price Commitments of the Japanese Producers and Installing an Anti-Dumping Law on the 'Grey-Market'—The Texts Have Been Given to the Council—Opposition by the United Kingdom and Ireland"]

[Text] Brussels (Agence Europe)—Following a long enquiry and in-depth negotiations with the Japanese electronic industry (with the participation of Community companies in the same sector), the European Commission has perfected a legal device intended to regulate the imports of microcircuits called EPROM (erasable programmable read-only memories) of Japanese origin. This device contains two elements:

a. A decision by the European Commission accepting the commitments on price by the seven Japanese producers/importers which together represent the near totality of EPROM exports to the EEC. This decision has been ready since the end of last year, but the Consultative Committees of the UK and Irish delegations voted against it. It follows that the Commission must submit its proposed decision to the Council before adopting it. If, within a month, the Council has not come to a majority decision different to the one proposed by the Commission, the latter retrieves its freedom to act and approves the decision;

b. A Council regulation establishing a "residual" anti-dumping duty that would affect EPROMs exported by firms that have not made price undertakings. In fact, there are none for the time being, but the EEC must take this precaution in order to deal with the possibility of the arrival of new exporters and especially to cover "gray market" sales, which exist for this product. The residual anti-dumping duty, set at a rather high level (94 percent), must guarantee that price undertakings will be respected.

The Commission has transmitted to the Council the draft of its decision and the draft Council regulation. The two texts must enter into force simultaneously in order to be effective. EUROPE believes that the following timetable has been established:

- Approval by the Council of the regulation on the residual anti-dumping duty on 4 March by qualified majority;
- Approval by the Commission of its decision (since a majority does not exist within the Council to oppose it) immediately thereafter;
- Publication of the two texts in the OFFICIAL JOURNAL of 7 March.

In the final analysis, the import scheme for EPROMs will be similar to the one defined for DRAMs (dynamic random access memories) in July 1990. The procedures

related to the two categories of microcircuits were similar, but the Commission, with backing from Community procedures, had given priority to the case of DRAMs which are economically more important and technically more complex; many solutions made in the case of DRAMs were able to be used as is for EPROMs. The analysis of the situation and the definition of the appropriate level for price undertakings nonetheless required several additional months. The main points and solutions chosen in this matter are as follows.

- The complaint was lodged in December 1986 by the EECA (European Electronic Component Manufacturers' Association). The Commission opened a procedure in April 1987, which included both diskettes and chips.
- The Commission considered that EPROMs of different densities and fabrication are similar products and that the investigation covered both EPROMs intended for commercial use and those for military application.
- The Community producers taken into consideration in the procedure are SGS and Thomson.
- The determination of the normal value of the products required complex calculations, as did the determination of the reasonable profit margin and the export price.
- The dumping margins for the period under consideration (April 1986 to March 1987) determined by the Commission on the basis of its calculations range between 35 percent and 106 percent depending on the exporter.
- The injury was assessed by taking into consideration Community production costs, the financial performances of Community producers, the market share held by Japanese producers, etc.
- In order to determine Community interest, the Commission considered the arguments against the introduction of anti-dumping duties (higher prices for EPROMs, higher costs for users, non-competitiveness of Community manufacturers) as well as the arguments in its favour, especially the observation that the technique for manufacturing EPROMs is essential for the existence of a strong European electronics industry. If this technology is not available, the entire semiconductor industry could collapse and it is a "strategic industry." Moreover, without European manufacturers, competition would be reduced and third country manufacturers would be in a position to impose prices and types of products. The Commission concluded that it is in the Community's interest to impose anti-dumping duties in order to protect Community manufacturers from unlawful practices.
- The measures to take should be "adapted to the dynamism of the EPROM industry, without excessively burdening the user industry."

In the final analysis, the solution chosen is that of the price undertakings subscribed by the following Japanese exporters: Fujitsu Ltd, Hitachi Ltd, Mitsubishi Electric Corp, NEC Corp, Sharp Corp, Texas Instruments Japan Ltd and Toshiba Corp.

The definitive residual anti-dumping duty aimed at preserving the efficacy of the price undertakings and taking into account imports into the Community from the "grey market," will be established at the level of 94 percent ad valorem, a rate considered to be sufficient to remove the injury.

Lagging Technology Seen Threatening European Prosperity

91GE0219A Duesseldorf WIRTSCHAFTSWOCHE
in German 5 Apr 91 pp 50-57

[Interview with Konrad Seitz, planning staff chief in Foreign Office, conducted by Stefan Baron and Wieland Schmitz, date and place not given: "This Is a Modern War: The Japanese Challenge and the Growing Threat to Prosperity in Germany"]

[Text]

WIRTSCHAFTSWOCHE: Mr. Seitz, your book, *The Japanese-American Challenge*, is being vividly discussed on the executive suites of German business right now. In it you say that our prosperity is threatened. Can you briefly explain what you mean to the readers who don't yet know your book?

Seitz: At the moment we are experiencing the third industrial revolution, which is being fueled by five new key technologies: Information technology, biotechnology, new materials technology, new energy technology, and space technology. But the European industry is not keeping pace in the world markets in most of these technologies.

WIRTSCHAFTSWOCHE: But we have an open world market now and can buy the things we need.

Seitz: We simply cannot leave the production of the newest things to others. A glance at the developing nations shows us that only the one at the technological top can also be at the top in standard of living.

WIRTSCHAFTSWOCHE: No national economy is as competitive in as many areas as the German one. We can offer the best automobiles and the best machine tools, the best chemicals...

Seitz: Yes, so far! But our top-ranking cars and top-ranking machine tools are already under massive attack from the Japanese, and in mass-produced cars and standard machine tools we have to compete more and more with the Koreans and Mexicans, and the Taiwanese and Brazilians as well. We cannot secure our future by sticking with the goods of the second industrial revolution—unless we want to be satisfied with the wages paid in Mexico and Korea. Only those who are at

the top can afford top wages, which means those who have little or no competition. That is why we must be at the forefront in the world markets, at least in some of the new technologies. There is something else as well: The information technology is a cross-section technology. It is responsible for how up-to-date our industry is, as well as our banks, our insurance companies, our airlines, etc.

WIRTSCHAFTSWOCHE: Computer chips and computers can be bought on the world market. Why do you have to manufacture them yourself?

Seitz: If we give up the production of goods of the third industrial revolution, we give up the production with the highest creation of value. It is, furthermore, very doubtful whether we are actually always able to buy the newest goods. Even for RAM [Random Access Memory] chips, which in our country are condescendingly described as raw material, the fact remains that the best chips, those with the fastest access times, etc., appear earlier in Japanese computers than on the world market. Or take machine tools: An engineer from General Motors told me that the newest generations of machine tools are installed one or two years earlier at Toyota than at General Motors. This is also natural, because many of the newest equipment goods are today developed by producers in close cooperation with the customer.

WIRTSCHAFTSWOCHE: Can't one say to the Japanese: Friends, if you don't give us the newest chips, we will shut out the products in which you put them?

Seitz: You are addressing the crucial point: the balance of forces. As long as we have things which the other one needs and can only get from us, he, for his part, will also give us the newest things. The crux of the matter is: unilateral or mutual dependence? It is clear, after all, that we alone cannot be at the top in all high technologies. But we must be so in some areas; then the world is orderly, then we are capable of cooperation on an equal basis. But the Europeans, with the exception of France, have no idea what is at stake, and they have no joint strategy.

WIRTSCHAFTSWOCHE: In hearing you speak like that, one could believe that we were in the middle of war.

Seitz: "War" is in fact a frequently used metaphor when the strategists of global enterprises speak of competition in high technology today. Previously, wars were fought for territory, today it is for markets. Anyone who can monopolize key technologies needs no colonial conquests. It is a modern form of "war," so to speak, which is being played out in the north, in the high-technology triad: North America, Europe, Japan. In the south, on the other hand, the concepts of the 19th Century still prevail. Saddam Husayn wanted to conquer territories and oil wells.

WIRTSCHAFTSWOCHE: Does that mean that the ruling powers of the future will be the economic superpowers and that military strength will no longer be so important then?

Seitz: What is important in the relations between the highly developed countries is primarily economic and technological strength. You can probably rule out that the American democracy will meet the challenge from economic superpower Japan with military force.

WIRTSCHAFTSWOCHE: You write that Europe is in danger of losing its high-technology industries in large areas, that in the year 2000, if the trends continue, not a single manufacturer of chips and computers could be left any more under European ownership. But surely the Japanese can be forced by means of local-content regulations to transfer their technology. After all, it doesn't matter who the owner is; what is important is only the jobs, the know-how and the income effects.

Seitz: If we in Europe were to have only Japanese and American high-technology companies, the newest generations of goods would quite naturally only be developed in Japan or America.

WIRTSCHAFTSWOCHE: What is so bad about that?

Seitz: The fattest profits are made with the newest products. Take RAM chips, for example. Each time you only make money at the beginning of the newest generation, then the prices fall sharply. Only the first companies to enter the market make money—and can afford high salaries. But besides that: The most interesting jobs will then be in Japan and America, where the research and development of the technology are taking place on the outermost frontier. Further, think of Europe's foreign policy situation in the world and its cultural influence! If Europe is only living on Japanese subsidiaries it will cease to be a leading region in the world.

WIRTSCHAFTSWOCHE: So you are not giving Siemens a chance to survive?

Seitz: Siemens is among the leaders in the world in some fields, such as medical electronics or digital communications systems. So it can only be a question of whether Siemens can survive as a semiconductor and computer producer. At present we have Siemens to thank for the fact that Europe has at least a trace of autonomy in highly integrated RAM chips. Siemens is trying to hold on. It is developing the 64-megabit chip together with IBM. The only thing is, Siemens had a loss of more than one-half billion German marks [DM] in the semiconductor field in 1990. The development costs for the 64-megabit chip are around 1 billion dollars. The cost of building a production line is 2 billion dollars. Anyone who spends that much money wants to and must see a profit at some point.

WIRTSCHAFTSWOCHE: Don't you see everything too much from the aspect of the producer? For the consumer everything the Japanese make is terrific.

Seitz: Yes. You get high quality at favorable prices. But the consumer is simultaneously a producer. And if he loses his job, even the favorable Japanese supply of

goods doesn't help him. Furthermore, you don't really know whether it will stay all that cheap once the Japanese have a monopoly.

WIRTSCHAFTSWOCHE: Why has Europe fallen behind so much?

Seitz: The central reason, from which all others can be derived, is that the consciousness has stayed behind. In the beginning of the 1970's, when Americans and Japanese already announced the information society, in Germany Wilhelm Fucks's book was still a best seller. Fucks believed that what was of decisive importance to the future power of nations was steel and energy production. Had he been right, the Soviet Union would today be economic power number one.

WIRTSCHAFTSWOCHE: Who among the Japanese saw to the necessary awareness?

Seitz: Primarily the Japanese elite bureaucracy.

WIRTSCHAFTSWOCHE: Why should bureaucrats be able to recognize future trends better than businessmen?

Seitz: That is a legitimate question for Germany; to Japan, and particularly to the Japan of the early 1980's, it does not apply. The Japanese bureaucracy lives in the tradition of the developing nation, in which the state sets the goals for development. These are the major "visions" which MITI [Ministry of International Trade and Industry] announces at the beginning of each decade. They are preceded by intensive gathering of information from all over the world. And preceded by endless rounds of negotiation with business and industry. MITI officials and Japanese industrial managers virtually live in a symbiosis. It is a tremendous and tremendously efficient apparatus, whose energies are aimed at creating Japan's economic and technological future. We have nothing comparable to counter with. The visionary and global-strategic thinking of the Japanese businessmen and managers all too often contrasts with our own Eurocentric business management. Seventy-seven percent of the German exports go to Europe, and this is also where we achieve our trade balance surpluses. We believe that we are a global export power, but in reality we are only strong in Europe. In the last few years our industry has at least started to invest heavily in North America. But in Asia we have no presence, now as before. All of four percent of our foreign investments went to Asia so far—in the gigantic space from Pakistan to Japan and Indonesia. Half of that, that is to say two percent, went to Japan, perhaps the world's foremost economic power until the end of the century.

WIRTSCHAFTSWOCHE: Is the Japanese success also the result of a more positive attitude toward technical progress?

Seitz: Yes, that plays a major role. Ultimately, everything can be traced to that awareness. The Germans of today are hostile to technology. Technology induces fear

in us. We only see the risks. And as a result of that, our good people are not entering technical professions.

WIRTSCHAFTSWOCHE: But our critical perception in the ecological technologies has brought us to the top.

Seitz: That is right. However, we should be aware that the Japanese and U.S. environmental protection industries are also outstanding. What is necessary to recognize is that ecology and high technology are not opposites but belong together. The environmental crisis is a crisis of the industrial age, and the high-technology age will lead us out of this crisis.

WIRTSCHAFTSWOCHE: So what can we do in order to find a connection?

Seitz: What is fundamental is to create a public awareness for the new era out of what I have said, and an awareness of the challenge. Our political elites are the ones primarily challenged in this connection. They must present competing drafts for the future shape of the information age. On the basis of a consciousness oriented toward the future, the European governments must create the infrastructure of the 21st Century by means of innovative procurement policies, such as an all-European fiberoptic network for broadband communication, a computer-controlled transportation system of the future, magnetic levitation trains and others. Projects such as these at the forefront of technology could push Europe's industries ahead and make them leaders in the world.

WIRTSCHAFTSWOCHE: That smacks of state interventionism.

Seitz: An innovative procurement policy conforms to the market. The information society is a free society. It focuses on the individual, and the mass society of the industrial age is replaced by a society of individual lifestyles.

WIRTSCHAFTSWOCHE: You can look at it differently as well. Think of Orwell.

Seitz: Orwell has been disproved by the PC. No, I remain convinced that the liberals should seize the task of creating the information society. But they should not just apply market economy and free trade theory in rigid dogmatism to the new technologies and to Japan. New conditions and, along with them, new laws apply here. We need a Japanese-style industrial policy for high technology, one which combines two normally conflicting tasks with each other: competition and government promotion of industry. It is at the same time an industrial policy which consistently concentrates on the newest industries and not, like the present one, keeps old industries alive with subsidies. Erhard would turn in his grave if he saw what we have made out of his market economy.

WIRTSCHAFTSWOCHE: Are you calling for a national or European industrial policy, for a MITI in Bonn or Brussels?

Seitz: A MITI in Bonn or Brussels, which drafts visions for the future of the European information economy and society and brings together the European industry for large research and development projects, would not be a bad thing. But first our policy must recognize that we have an existing problem which we have to solve. Then we will also find the ways to solve it. As long as there is no awareness that there is a problem it makes little sense to discuss measures. None of them would be feasible with today's state of awareness.

WIRTSCHAFTSWOCHE: At the moment, however, we have an entirely different existing problem in the east of our country!

Seitz: We certainly do. And this makes the solution of our second existing problem, namely the task of keeping up with the third industrial revolution, so particularly hard. "You are building streets and houses," Mr. von Dohnanyi said not long ago to a Japanese, "and we invest in high technology—in the year 2000 we'll get together again." I can only hope that we will muster the political will to accept both challenges. We have the strength. The German unification also has another, second, effect. Demand from the new Bundeslaender is creating high economic growth in western Germany. In the middle of the boom we don't notice that some companies—our semiconductor and computer firms—are recording increasing losses and are threatened by failure or takeover by Japanese and Americans. While in our consciousness there is only more Germany and at most Europe and the Gulf, in a silent battle the Japanese are monopolizing the key technologies of the 21st Century in the world market.

EC: Four National R&D Programs Approved

91AN0349 Brussels TECH-EUROPE in English Mar 91 Section III, p 6

[Text] Four government programmes to subsidise research have been approved by the European Commission under its Rome Treaty state aid rules (Article 92). The Commission go-ahead concerns two schemes in Italy, one in Denmark and one aimed at the former Laender of East Germany.

Italy

The larger of the two Italian projects concerns government subsidies to encourage SGS-Thomson Microelectronics' research into complex personalised and programmable integrated circuits.

The Italian Government subsidies fall under the framework of its funds for applied research, approved by the Commission in April 1990. The programme specifically consists of advantageous interest rates and a capital grant. The subsidies total Lire 87.3 billion (56.7 million European currency units [ECU]) on an investment of Lire 283.1 billion (ECU184 million). Subsidies will cover 50 percent of basic research and 24 percent of applied research costs.

The Commission said it reached its decision because the aid package supported technological progress and would not distort the Common Market.

The second Italian subsidy programme, which also falls under the framework of the Government applied research fund, is aimed at encouraging research by pharmaceutical company Farmitalia Carlo Erba in the area of "Penem Antibiotics."

It consists of low interest rate loans and a capital grant of Lire 10.3 billion (ECU6.7 million) on an investment of Lire 36.2 billion (ECU23.5 million).

The subsidies will cover 50 percent of basic research costs, 25.6 percent of applied research costs and 76 percent of the cost of research carried out in Italy's underdeveloped south, the Mezzogiorno.

Denmark

The Danish Government asked and was given Commission approval for a programme subsidising foreign researchers recruited by companies and institutions carrying out research and development projects vital to the economy.

The project has a yearly budget of Kr 20 million (ECU2.5 million) for 1991, 1992 and 1993. The subsidies will cover part or all of the income tax of the researcher recruited and will be limited to two years.

In reaching its decision, the Commission said the project did contain elements of state subsidy (as outlined by Article 92 (1) of the Rome Treaty) in that companies would not have to spend the extra money usually expected to attract a highly qualified researcher.

However, it concluded that the programme would not distort the Common Market and in any case is in line with the Commission's own programme, Science.

Germany

The German Government's juggling of its research and development programmes which won Commission approval involves allowing subsidies in these sectors to be 10 percent higher in the five former Laender of East Germany and East Berlin than the rest of the Federal Republic. This higher level of aid would last until 31 March 1991.

At the same time the government is in the process of abolishing the 10 percent extra research and development aid allowed for West Berlin.

The Commission said its approval for the subsidies to the former territory of the ex-GDR was based on Article 92.3 of the Rome Treaty (which allows aid to promote economic development of areas where the standard of living is abnormally low or where there is serious underemployment).

It said promoting research in the new Laender was an essential condition for developing its industries which are adapting to the market economy.

The Commission warned that approval of the extra aid for East Germany could be reversed because of the ongoing discussions about regional aid in Germany.

EC To Coordinate Dissemination of R&D Results

91AN0299 Luxembourg OFFICIAL JOURNAL OF THE EUROPEAN COMMUNITIES in English No C53, 28 Feb 91 pp 39-45

[Article: "Proposal for a Council Decision on the Dissemination and Exploitation of Knowledge Resulting From the Specific Programmes of Research and Technological Development of the Community"—COM(90) 611 final]

[Excerpts] The Council of the European Communities [passage omitted]

Has adopted this decision:

I. Definition and Implementation of the Centralized Action

Article 1

1. The dissemination and exploitation of knowledge shall be carried out as part of the specific Programmes and by means of a centralized action.
2. The centralized action, as defined in Annex I, shall ensure overall coordination and cohesion in the field covered by the framework programme. It is adopted for the period between the date of publication in the Official Journal of the First Decision adopting a specific programme under the framework programme (1990 to 1994) and 31 December 1994.

Article 2

1. The amount of Community expenditure deriving from the levies on the sums considered necessary for the specific Programmes, with a view to the implementation of the centralized action established by this Decision, is estimated at 57 million European currency units [ECU].

The amount includes staff costs, which may amount to a maximum of 6 percent. An indicative breakdown of expenditure is set out in Annex II.

2. Should the Council take a decision in implementation of Article 1 (4) of Decision 90/221/Euratom, EEC, this Decision shall be adapted to take account of the above-mentioned Council Decision.

3. The budgetary authority shall decide on the appropriations available for each financial year.

Article 3

1. Before the end of 1992 the Commission shall review the action and address a report on the results of the

review to the Council and the European Parliament, together with proposals for any necessary changes.

2. At the end of the action the Commission shall assess the results obtained. It shall address a report thereon to the Council and the European Parliament.

3. The reports shall be drawn up having regard to the objectives set in Annex I to this Decision and in accordance with Article 2 (4) of Decision 90/221/Euratom, EEC.

Article 4

The Commission shall be responsible for the execution of the action. It shall be assisted by a committee of an advisory nature, hereinafter referred to as "the Committee," composed of the representatives of the Member States and chaired by the representative of the Commission.

Article 5

1. In the cases referred to in Article 6 (1), the representative of the Commission shall submit to the Committee a draft of the measures to be taken. The Committee shall deliver its opinion on the draft within a time limit which the Chairman may lay down according to the urgency of the matter, if necessary by taking a vote.

2. The opinion shall be recorded in the minutes; in addition, each Member State shall have the right to ask to have its position recorded in the minutes.

3. The Commission shall take the utmost account of the opinion delivered by the Committee. It shall inform the Committee of the manner in which its opinion has been taken into account.

Article 6

1. The procedure laid down in Article 5 shall apply to:

—The evaluation of the projects proposed, as well as the estimated amount of the Community's financial contribution,

—The definition of the confidentiality criteria applicable to the dissemination of the results,

—The precise implementing agreements concluded with non-Community countries,

—Measures for evaluating the action.

2. The Commission may consult the Committee on any matter falling within the scope of the action.

II. General Provisions

Article 7

1. The dissemination and exploitation of knowledge resulting from the Community's specific research and technological development programmes shall be subject to the following rules:

a. The knowledge resulting from work undertaken directly or financed wholly by the Community shall be the property of the Community.

That resulting from work under a shared-cost contract shall be the property of the contractors who carry out the work.

b. Knowledge which could be used in an industrial application, if its nature justifies such a measure, shall be protected to the extent required in the light of the interests of the Community and its co-contractors and in accordance with any applicable legislation or conventions.

c. The Community and its co-contractors shall exploit the knowledge in their possession, or have it exploited, in conformity with the Community's interests, and taking full account of the objective of strengthening economic and social cohesion in the Community.

d. Knowledge belonging to the Community shall be made available to its co-contractors and to interested third parties established in the Community who can prove that they need the knowledge and who undertake to exploit it or have it exploited in conformity with the Community's interests. Such provision of knowledge may be subject to appropriate conditions, particularly concerning the payment of fees.

All contractors shall make the knowledge in their possession, together with any information necessary for its use, available to the co-contractors and to interested third parties who satisfy contractually defined conditions.

e. The Commission shall ensure that knowledge suitable for dissemination is disseminated or published either by the Commission itself or by its co-contractors, without any restrictions other than those imposed by the need to safeguard intellectual property, confidentiality or legitimate commercial interests.

2. The Commission shall lay down the arrangements for implementing the rules laid down in paragraph 1.

Article 8

This Decision is addressed to the Member States.

ANNEX I

Aims and Content

The general aim of the centralized action for the dissemination and exploitation of knowledge resulting from Community research activities, carried out under this programme, is to give specific added value to the R&D activities which are the subject of the third framework programme for 1990 to 1994. On the one hand, it provides the necessary continuity for some of the measures carried out under the VALUE programme; on the other, it introduces new topics concerned particularly

with the repercussions of research and technological development activities and their results on society as a whole.

This centralized action is to be conducted in accordance with the following guiding principles.

a. Horizontality

Measures to publish and utilize research results must apply to the whole range of Community R&D activities, irrespective of the nature of programmes, the persons involved and the administrative authorities responsible. This criterion means that this centralized action is one of a series of horizontal measures including programmes like Monitor which is designed to come up with scenarios and strategies for future research.

b. Internal Complementarity

The centralized action does not rule out, in fact to some extent it presupposes, measures taken within each specific programme to promote the dissemination of the results. It supplements and coordinates the measures taken under specific programmes. It also concentrates on activities requiring special infrastructure (computerized information systems, a network of "relay stations," etc.) or special capabilities for transferring know-how to fields of activity in other disciplines.

c. Subsidiarity

The centralized action takes account of the synergies between decentralized (public and private) and Community R&D activities and is designed, in conjunction with other Community measures (regional development programmes, SPRINT [Strategic Program for Innovation and Technology Transfer]), and in cooperation with the national and regional authorities responsible, to establish a single space for the utilization and transfer of the technologies and the know-how obtained from research and technological development.

As far as the content of the present programme is concerned, those measures already launched to forge closer links between research and industry will be supplemented by other new measures designed to forge closer links between research and society and between research and the scientific community. These are measures which reflect the new scientific and technological objectives and constraints set by society and its institutions, and the increasing interest in an interdisciplinary approach to research and technological development activities. At this stage, and now that its activities are more developed, this centralized action will incorporate these new topics into its conceptual and operational framework.

1. Research-Industry Interface

The aim is to help to improve the international competitiveness of Europe's industry in accordance with the provisions of the EEC Treaty by means of specific projects designed to maximize the impact of Community

R&D activities on industry as a whole. It is up to companies, first and foremost, to make good use of the results.

Cooperation between universities and industry is encouraged within the framework of specific programmes. The centralized action will help organizations involved in Community R&D projects to protect their findings, but at the same time to exploit and promote them. The following measures are proposed.

A. New Channels of Information for Companies

A network of "relay stations" will be set up to promote Community R&D. This will be done by developing the channels already made available for providing companies with information and for disseminating results. It will provide multifunctional support for the measures planned under the present programme. These relay stations will have special access to Community information and will be able to tailor this information to the various needs which arise at decentralized level. They will also allow companies, particularly small businesses and businesses located in the more peripheral and least favoured areas of the Community, to enter into contact with centres of excellence.

The relay stations will have a role to play both downstream and upstream of specific programmes. Upstream, these relay stations will provide information (by publishing newsletters, translating documents, organizing conferences, etc.), advice and assistance (by helping small businesses to define their Community strategy and to find, and negotiate contracts with, partners). Downstream, they will help with the centralized action to publish and utilize research results consolidating links between the companies and laboratories requiring information at local or national level and the supply of information at Community level (by organizing targeted dissemination projects and information and training campaigns).

The scientific, technical and industrial community will help to select the relay stations in the Member States and to define their specific tasks. In order to make them as dynamic as possible, the quality of information flows will be improved and be made more efficient.

Once the VALUE programme has been completed, a basic service, CORDIS, should become available. As of 1991, the availability of this service can be speeded up by allocating more resources to it within the framework of the centralized action. After 1993, the aim of centralized action will be to update and add to Cordis data in order to ensure that there is no breakdown in the service. The service will have to provide new functions and continue to expand by including other sources of information. The proposed pattern of development will include: making the service more user-friendly; extending the service by integrating other databases from European bodies or programmes; using electronic storage devices (CD-ROM and video disc); developing systems for electronic data exchange between selected

users, including the relay stations, which could allow additional information services or special access facilities for certain private data providers.

The development of computerized methods does not exclude the use of more traditional methods like the publication of bulletins and bibliographies which will provide wider access to information services.

B. Utilization of Results

This action, which was already started in the VALUE programme, should be extended to the new fields covered by the framework programme and developed in line with the results that become available in the years ahead. This means utilizing the research and development results of which the Community is the owner and, where needed, helping to utilize the results of research and development projects undertaken on a shared-cost basis. In the latter case, the aim will be to help contractors who do not have sufficient expertise, in particular the universities and SMEs [small and medium-sized enterprises], to take advantage of the results of their research and development work.

The work to be undertaken as part of a real Community design engineering service could take different forms depending on each specific case:

- Identifying, controlling and appraising the results of research in order to develop and target utilization plans;
- Finding licensees especially for the JRC [Joint Research Center] and, more generally, parties interested in utilizing results;
- Providing adequate financial support for studies or tests and experimental developments.

This work will be carried out with the help of outside experts and competent organizations in the Member States.

C. Protection of Results

The protection of results belonging to the Community and management of the patents portfolio that it holds will be continued, as in the past, through systematic examination of the final reports and results obtained by the JRC. The actions described below, which have already been started in the VALUE programme, will be developed more intensively by the centralized action.

Those universities, research centres and SMEs which do not have a patents department will, on request, be provided with aid by the centralized action. It will supply expertise on patents and financial support limited to the costs of searches for prior claims to novelty and first patent applications.

Public awareness campaigns can also be organized on the importance of protecting results for the research scientists participating in Community R&D Programmes.

D. Promotional Activities

Promotion of the results among the scientific and educational community and in the world of business could take the following form: financial support for organizations making an active contribution to the promotion of results and, in general, for organizations within a transnational network set up in order to facilitate, promote and coordinate access to Community programmes; organization of seminars, conferences and other means of communication, including in association with the respective bodies in the Member States and, in particular with the "relay stations"; attendance at trade fairs. Specific activities are planned to provide economic and social cohesion in countries where dissemination and utilization structures do not exist or are still in their infancy.

2. Interface Between Research and the Scientific Community

The objective of the activities under this heading is to contribute to the inter-disciplinary reflection already underway about research, and the methods, problems and position of research in the whole range of human activities. The actions in question open a new chapter on "research on research." They will involve inter-disciplinary contributions and will be structured around the four following axes:

A. Institutions of Research

The aim is to apply the disciplines of law, political sciences, social and human sciences to a series of aspects of R&D. In particular, the following topics will be studied: questions of intellectual property and other civil law and public law aspects; ethics; history and comparative analysis of public and private research structures; international rules on scientific and technological information, especially with regard to the constraints or opportunities for the optimal dissemination and exploitation of knowledge resulting from specific programmes.

B. Communication of Research

The objective is to apply findings in certain disciplines, such as logic, semiotics, epistemology and cognitive sciences, to the analysis and development of the communication of research. This will involve, in particular: the transfer of scientific and technological know-how to the various classes of user; scientific language in relation to external variables of a socio-cultural nature; the aspects of communication which, by using transcriptional models, allow an interdisciplinary fabric to be constructed which covers the wealth of scientific and technological knowledge.

C. Economics of Research

Macroeconomic instruments and business sciences must be used to determine the optimum use of resources to be channelled into research as part of general economic development objectives and company objectives. The economic and econometric bases must also be provided

for research investment policies, in particular with reference to commitments from the Member States and the Community. Taking account also of studies conducted in other contexts, the cost-benefit aspects of the cycle of research and development, and the economic obstacles to its exploitation, will be examined.

D. Management of Research

Management studies will help with the organization of research and laboratory management. They can make a contribution to project management, administrative procedures and methods of management. Particular attention will be paid to subjects relating to decentralized management and making more efficient use of human resources in the departments which manage research. Comparative studies will be conducted on the different management models used by university and industrial research institutes.

From an operational point of view, measures to consolidate links between research and the scientific community will take three forms:

- (a) support for studies and research by institutes and academics in the four subject areas described above, usually according to the additional costs formula;
- (b) contribution to studies, monographs, theses and articles, according to special selection procedures;
- (c) contributions to conferences and other academic events.

3. Interface Between Research and Society

This heading covers measures designed to identify and study the impact on society of the new scientific and technological knowledge acquired as a result of Community activities. The aim is to spread scientific know-how widely through Europe. This is a new and essential component of the centralized action, the aim being to make changes in the contemporary approach to science compatible with future plans for our society.

This reflects the more mature and at the same time more critical attitude now being adopted by the public. There is an increasing reluctance to accept implicitly the principle that scientific and technological progress is a priori and in every case beneficial to man and society.

The centralized action can help better to direct the Community's R&D policy by paying particular attention to the areas where interaction between science and technology on the one hand and society on the other is particularly critical (or is perceived as such). To this end, it should take its place in an efficient interactive process consisting of the following stages: research, research results, public perception and reaction, assessment of social impact, modification of research activities where necessary. In order to ensure that this procedure works effectively, close links will have to be forged across the board with the specific study programmes developed

prior to the policy making process. The centralized action will be in three parts.

A. Contribution to Assessment of the Social Impact of Science and Technology

In conjunction with the more specific activities provided for in the individual specific programmes and with the activities of the Monitor programme, more general "technology assessment" schemes will be developed. Those areas which will be specially monitored and studied are not only those which relate to the exploitation of new technologies affecting health, safety, and the environment, but also ethical and legal questions relating to the exploitation of results. These studies will be conducted with the help of experts in these various fields while maintaining close contact and dialogue with those who are specifically involved in defining strategies and programmes.

B. Communication With the Public

Appropriate channels of communication, particularly through the mass media, will be used to provide information for the public. Special use will be made of the relay stations mentioned above. The Member States will be involved with providing information and for coordination between Community, national and regional channels of information.

C. Analysing Public Demand and New Requirements

In conjunction with the other programmes concerned, the centralized action will provide studies and surveys designed to identify the latest social needs. Through its direct contact with actual or potential users of the knowledge resulting from R&D programmes, it will offer a rich and varied source of information concerning needs related to the standard of living and the quality of life, as well as in terms of the need to provide greater production and economic opportunities in a coherent Community context.

ANNEX II

Indicative Breakdown of Expenditure	
	Percentage
Research-industry interface	70/75
Research-scientific community interface	15/12
Research-society interface	15/12
Total	100/99

The above amounts include administrative and staff costs.

Despite this breakdown into different areas, projects may nevertheless fall under several areas.

EC Presents Third R&D Support Program to Industry

91WS0216A Paris AFP SCIENCES in French
21 Feb 91 p 3

[Article: "Third European R&D Support Program Presented to Industry"]

[Text] Paris—The third European Communities technological research and development support program (PCRD) as a whole for 1990-1994 was presented to French industrial research officials during a seminar held in Paris by the National Association for Technical Research [ANRT] from 13 to 15 February.

Budgets skyrocketing—91.2 billion European currency units [Ecu] in 1991, or twice the 1988 budget—new programs, and an increasing rate of "consummations" of team-ups and EC projects: Taken together, we are witnessing a "formidably powered lift-off" of EC actions, say EC Commission program officials who took part in the seminar.

A recent study of the impact of EC programs on the French scientific and technical fabric reveals that the enterprises concerned represent "more than half the French industrial research potential." Another study, conducted by ANRT-Europe on the basis of 1,320 projects, shows that France's rate of participation is 48 percent, putting it in second place among the contracting nations, immediately behind Great Britain (50 percent).

The participants emphasized that the support program's primary objective is to stimulate cooperative ventures among the EC member countries (3 to 5 per project, on average) and to create a "European Community of Research and Technology," as an essential component of the Single Market and "spearhead of European industry."

The Commission will also be able to negotiate agreements with the countries of Central Europe, with a view to associating them with programs bearing on the environment, biotechnologies, and farming and food industry. The SCIENCE program (training of researchers), for its part, is opening up to Poland and Hungary. Training is one of the Commission's major objectives. Applications for scholarships under the ERASMUS program alone totaled 31,000 for the year 1989-1990. The Commission granted scholarships to approximately 27,500 students and financed 1,507 interuniversity cooperation programs. In 1990, 4,000 French youths, including more than 400 engineering students, spent an average of 7 months each in a foreign establishment.

Standardization at the European level is also a priority for the Commission. Between now and 31 December 1992, the specialized European organizations will be having to adopt standards at the rate of approximately one a day...

EC Commission Proposes Information Services Incentive Program

91AN0421 Amsterdam COMPUTABLE in Dutch
17 May 91 p 13

[Article: "European Commission Produces Proposal for IMPACT II"]

[Text] Brussels—The European Commission has prepared a proposal for a program with an 100-million European currency units [ECU] budget (about 230 million guilders) aimed at promoting electronic information services in areas such as databases and videodisk storage. The Information Market Policy Actions (IMPACT) program will last five years and consist of two phases.

The Commission expects that the total market for electronic information services will represent about ECU100 billion by the year 2000. According to the Commission, IMPACT II, which is the successor to the IMPACT I R&D program started in 1988, can greatly improve the position of the Common Market. "Both the availability of information services on a European scale and the creation of an internal information services market are necessary in order to enable organizations to take advantage of the European single market in 1993," announced a Commission spokesman. IMPACT II has four parts. Nearly half of the IMPACT II budget is destined for the development of databases for the scientific community. ECU34 million have been set aside for the improvement of user-friendliness and to develop standardized interfaces facilitating database access. A part of this amount will go toward demonstration projects in the fields of SGML (standardized general mark-up language) and ODA (office document architecture).

EC Adjusts Information Technology Policy

91AN0415 Amsterdam COMPUTABLE in Dutch
5 Apr 91 pp 1, 2

[Article by Nigel Tutt and Robbert Hoeffnagel: "No New Subsidies for IT Suppliers—EC Publishes 'Hands-Off' Industrial Policy"]

[Text] Brussels—The European suppliers of automation products should not count on new subsidies from the European Commission. This is evident from plans made public last week by Filippo Pandolfi, responsible for information technology and telecommunications in the EC.

The release of Pandolfi's policy regarding the information technology and electronics sector in Europe came after heated discussions within the Commission and with the industry. For the first time, the European Commission wants to pursue a standoffish policy rather than directly intervening through subsidies. It is the Commission's intention this time to create a general environment enabling European industry to secure its future independently and by its own resources.

Pandolfi's policy consists of five points. First, Brussels wants to increase demand for information technology products, e.g., by encouraging government institutions to interconnect various data bases, thereby making it more interesting for users to consult them electronically, thus increasing the demand for IT [information technology] products. Second, within the framework of the European Strategic Program for Research and Development in Information Technologies (ESPRIT), more emphasis is given to research aimed at strengthening the technological base of European suppliers. Examples are software engineering, high-performance computer systems, and semiconductors. Third, Pandolfi wants to stress training, in particular multidisciplinary training projects. The fourth point concerns trade policy: Non-EC markets should be as open for EC products as the EC market is for their products. The fifth and final issue involves the improvement of the "general business environment."

In an explanatory note to his policy, Pandolfi said: "Our policy document does not stipulate any specific targets for individual companies. We focus on the overall industrial environment within the Community, which is exactly the same approach adopted by the United States and Japan." According to Pandolfi, the current problem for the European information technology industry is the sharp drop in the exchange rates of the yen and the dollar against the ECU. Another problem mentioned by the EC top official is the financing of Japanese companies with funds made available at extremely low interest rates.

Despite these financial aspects determining the position of the European information technology branch, the industry should not count on new subsidies. A major part of the policy document consists of a description of existing subsidy schemes, completed by Pandolfi with an explanation of the last phase of ESPRIT, which stresses topics such as software engineering.

In his explanatory note, Pandolfi also discusses the import duties levied by the EC on some products. The removal of these barriers is being discussed within the framework of the GATT [General Agreement on Tariffs and Trade] Uruguay Round. During the negotiations, the European Commission proposed to lower the duties on chips imported into the EC from 14 to 9 percent. However, the United States and Japan want to see these import duties completely abolished.

Pandolfi urged individual European information technology companies to restructure and increase their competitiveness. In this respect, increasing user demand for information technology products can be a major aid. Demand could be substantially increased by such projects as the one that seeks to interconnect various data bases to what is sometimes called the "European Nervous System," which will involve an estimated investment of 50 to 60 billion Dutch guilders over a period of 10 years. However, with a mere 40-percent share of the still rapidly growing European information technology market, it still remains to be seen whether the European information technology industry will benefit

sufficiently from such projects. Reserving the whole project or parts thereof for European industry is hardly possible, according to observers. The United States and Japan have already expressed their concern about the possibility of such protectionism.

EC 'Hands Off' Computer Industry Policy Criticized

91AN0368 Amsterdam COMPUTABLE in Dutch
5 Apr 91 p 3

[Article: "EC: Betting on the Wrong Horse"]

[Text] The European Community has decided not to launch any new subsidy programs for the information technology (IT) industry. Shortsightedness or just the contrary? It is indeed a shortsighted policy because the EC member states have only one product to export, i.e., advanced knowledge. The viability of European industry in general depends largely on its lead in terms of knowledge.

The IT industry is one of the sectors where technological knowledge can be applied easily. Apart from directly broadening science, the IT industry is an implement to help other branches of industry keep pace. Automation in companies usually fulfills a key function, which can also be performed with non-European computers. However, direct and indirect industrial spin-offs have appeared to be so significant in recent years that it is desirable and even necessary to preserve this industry.

Although Filippo Pandolfi, responsible for IT at the EC, claimed that "Japan and the United States are taking an identical approach," results and comments of European automation companies clearly indicate that their knowledge is seriously lagging behind and that incentives and projects to catch up are of vital importance. Obviously, this will cost a lot of money. However, the EC is pouring billions of community funds into projects which have a much deeper bottom than the IT industry. There are many examples: the agricultural policy (butter mountains and milk lakes), environmental subsidies (some subsidizing authorities feel happy if one environmental project per year actually gets past the subsidizing step), and, last but not least, the oversized and overspending EC organization itself.

In view of all this, it is unforgivable that the IT industry is being disregarded. Instead, the EC should better try to establish a process to concentrate and increase the scale of the fragmented automation industry. Even if that happens, there is still a long road ahead, but at least a number of European companies will be given a fair chance.

EC Electronics Policy Toward Japan Criticized

91AN0357 Paris *ENTREPRISES & TELECOMMUNICATIONS* in French
Apr-May 91 pp 80-81

[Article by *ENTREPRISES & TELECOMMUNICATIONS* Brussels correspondent: "The Cape of Storms"]

[Text] Upon reaching the half-way point of his mandate as head of European telecommunications and information technology, EC Commissioner Filippo Pandolfi has not yet passed the Cape of Storms. On the contrary. Following the enthusiasm raised in 1987 by the publication of the Green Paper on telecommunications, more and more voices are heard in industrial circles, as well as in Brussels, regretting the lack of European wind. Who is to blame?

Things are no longer working out, at least not between supporters of an "enlightened controlled economy" and the ultra liberals, who, like the British, almost systematically torpedo any EC initiative that resembles—closely or remotely—a return to state control.

This antagonism, however, does not account for everything. Personal conflicts, clumsy administration, or a lack of knowledge of industrial realities are so many shackles to any real strategy. The semiconductors affair is an example of this. The report on European policy in this strategic sector has been in the Commission's bottom drawer for more than six months. Meanwhile, the installation of a Japanese chip plant in Germany and the takeover of ICL by Fujitsu are two prime examples of the present state of confusion.

Now, time is running out. The Italian Commissioner has less than two years to prepare telecommunications and information technology for the 1993 enlarged market. In view of the current situation, this seems a daunting task. However, a task force set up early February by the Commission and industry representing both European manufacturer and end-user organizations should be able to bring about an improvement for Europe's new technologies.

Europe is strange. While the European semiconductor industry is at a low ebb, Mitsubishi, one of its principal competitors, obtained a Fr40-million subsidy from the EC Commission in Brussels last December—around 3 percent of Mitsubishi's total investment—for the installation of a new chip plant, which will be operational by 1992. The subsidy was granted through EC funds designated to help declining industrial regions. The new Japanese plant is located in North Rhine-Westphalia, a German region hit hard by the closure of its coal mines and now benefiting from subsidies coming mainly from the European Regional Development Fund (ERDF).

This is not an unusual practice, argue some Commission officials. Once all conditions have been met—a positive impact on the labor market, large potential prospects, a contribution of know-how—there was no legal basis to

turn down an ERDF grant. Besides, it is stressed, the Americans have already benefited from similar investment support in Scotland and Italy. However, this decision was not appreciated unanimously within the European Community. A good number of Commissioners, among whom Jacques Delors [Commission president], have expressed frustration over the appropriateness of such a measure while the Japanese market remains hermetically sealed against European enterprises. Filippo Pandolfi has not hidden his disappointment. "This request seems excessive to me, and I strongly doubt that Mitsubishi would help us set up a similar plant," he says with irony.

For their part, industrialists have expressed a certain fatalism. "It is an entirely correct decision from a formal point of view," states the European Association of Electronic Components Manufacturers (EECA). The EECA moans that this absurd situation is brought about by the absence of a European industrial policy that guarantees a respect for the rules of the game at both the internal and external level. European manufacturers regularly point out the paradox of helping a company today that yesterday stood accused of dumping practices which were extremely harmful to the European electronics industry. In general, the EC's electronics industry is in a rather worrisome weak position. Clearly, it is unable to satisfy demand in active dynamic memories, and the millions of chips leaving the assembly lines in Aachen will not straighten things out.

The takeover of ICL, the leading British computer manufacturer, by Fujitsu is another example of difficulties facing the EC Commission and European governments in responding to the problems in the electronics industry.

The Round Table of electronics manufacturers, created in 1970 as a Commission initiative to reinforce the European position, expelled ICL late January. "The participation of a company controlled by the Japanese goes against the objectives of this Round Table," it was declared. Will this expulsion affect ICL's participation in EC research programs?

An official response from the Commission has yet to come. The only sign came at the end of last year. At the time of the ESPRIT conference, Michel Carpentier, director general of DG XIII (the Commission directorate responsible for telecommunications and information technology), indicated that there was no reason to reconsider ICL's participation in the Joint European Submicron Silicon Initiative (JESSI), a European program for developing the chips of the future. Nevertheless, was it not so long ago that a vow was made in Brussels not to associate Japan in such actions? At JESSI's headquarters in Munich, things are viewed more pragmatically and it has been stated that ICL's participation will be studied case by case, according to programs and the opinions of other participants. The blurred image caused by the takeover does nothing to help end the difficulties surrounding European electronics.

To face the current crisis, it is necessary to act in an apparently contradictory manner: To create, on the one hand, the conditions to develop competition, while establishing, on the other, a system that allows the Europeans to strike out together whenever there is a common goal. To do this, there is no lack of American and Japanese examples. Both countries have armed themselves with a wide arsenal of economic policy instruments. During the public session of the European Parliament in December 1990, the German deputy, Detler Samland, author of the ESPRIT report, stated: "It is not only cooperation between manufacturers and end-users that is limited in Europe, also the relationship between themselves is stuck with misunderstood liberalism. The Japanese, on the other hand, see competition as a rivalry between nations, and are therefore ready to reinforce cooperation between their banks, enterprises, and the Ministry of International Trade and Industry (MITI), and their objective is to set up monopolies protected wherever possible by customs restrictions, the old liberal philosophy peculiar to European competition being an obstacle to consolidate their own market and to exploit new openings in Asia."

During the presentation of an expert committee report on 15 February emphasizing the need to launch a massive European supercomputer program, Professor Carlo Rubbia, director of the European Nuclear Research Center (CERN), made it clear that it was unnecessary for Europe to enter into a conflict with the United States and Japan, but rather to assert itself as a true partner in an open world system.

"However," he stressed, "to be a partner with worldwide credibility means not only to be on the receiving end, but also to have something to offer." This remark goes not only for supercomputers, but for the electronics industry in general.

EC Commission To Aid Electronics Industry

91WS0275A Paris LE MONDE in French 26 Mar 91 p 19

[Article by special EC correspondent Philippe Lemaitre: "Brussels Wants To Save Europe's Electronics Industry"; first paragraph is LE MONDE introduction]

[Text] The European commissioners of research and industry, Mssrs. Filippo Maria Pandolfi and Martin Bangemann, were scheduled to present a draft rescue plan for the European electronics industry to the Brussels Commission on Tuesday, 26 March. The industry is in the throes of a deep crisis. Therefore, the Commission may, for the first time, commit itself to an industrial policy for a particular sector, despite the opposition of the ultra-liberals.

How can a European electronics and computer industry that is currently in particularly dismal shape be saved from a complete rout? In a communication that it is expected to adopted Tuesday, the European Commission—recognizing that the establishment of a large

internal market alone will not be enough—suggests that the Twelve think about a series of steps affecting demand, technological cooperation, training, foreign relations, and company environment.

This initial attempt to implement a coherent industrial policy in a sector that is considered strategic and threatened is still timid. It bears the marks of a debate between economic liberals and interventionists that is far from over. The Commission stresses that, at most, it is a matter of supporting initiatives to be taken by the companies themselves. However, with necessity making right, the move marks a real break from the foregone conclusion of *laissez-faire* that had prevailed in Brussels since the Single European Act became effective.

The European electronics industry is growing sharply (15 percent a year over the preceding decade) and can flatter itself that it holds solid positions in several areas: software, data processing services, industrial automation, and telecommunications. But the latter cannot conceal disquieting weaknesses, mainly in the realms of semiconductors, peripheral equipment, data processing, and even consumer electronics. As a result, the industry's production covers about 75 percent of the needs in Europe, compared to 140 percent in Japan.

This imbalance, which points up the insufficient competitiveness of companies, has generated a balance of payments deficit that is worsening. In 1989, it reached 31 billion ecus (215 billion French francs [Fr]).

An unindulgent analysis of the causes of the present shortcomings is chilling: The picture is one of insufficiently powerful groups that, in contrast to the Japanese or the Americans, missed their opportunity for vertical integration, exhaust themselves in restructurings, and do not have the necessary financial base to expand their production capacities and successfully carry out their research programs.

The question is whether our manufacturers have any chance of overcoming handicaps as countless as these: a still fragmented market, deprived of the indispensable economies of scale; a demand (from the rest of the industry) that is relatively undynamic, undemanding, and lacking in the leading edge users that set the tone in the United States and Japan; a lack of qualified personnel; and a tendency to withdraw into oneself that results in an overly-cautious approach—except in the area of precompetitive research—to Community and international cooperation, and especially to the possibilities opened up by the large technological programs implemented by the EC (ESPRIT [European Strategic Program for Research and Development in Information Technologies], RACE [Research and Development in Advanced Communications in Europe], BRITE [Basic Research in Industrial Technologies for Europe], etc.) or outside of it (Eureka [European Research Coordination Agency]).

Impediments to Competition

The authors of the report discuss at some length the impediments to free competition that hamper European companies in both the United States and Japan, and the substantial support that the public authorities of those two countries give to their national industry.

In the United States, [this entails] massive orders of highly technological equipment, notably by the Department of Defense, discrimination against American companies of foreign origin, and trade pressures exerted abroad in violation of the rules of GATT (General Agreement on Tariffs and Trade).

In Japan, there is support for cooperation among companies in defining strategies and scientific and technological collaboration, virtual closure of public markets to foreign companies, and support for the creation of large, diversified groups. The hegemonic ambitions of Tokyo are presented without the usual careful language: "Japanese development is not solely the result of market forces, but the product of a long-term strategic plan, in which the role of public authorities has been central (...). Japanese industry appears to be implementing a strategy that is leading, step by step, to gradual control of the world electronics market: after consumer electronics, components; now computers, and perhaps, between now and the end of the century, telecommunications."

The Commission is implicitly admitting that, compared to this American and Japanese government involvement, the action of the Community authorities has been lacking in scope. It is time to expand it, the Commission stresses, while keeping in mind two priorities:

1. Gaining adequate access for our companies to the American and Japanese markets, whether for exports, investments, or technologies;
2. Making it possible to master technologies in Europe itself.

"This mastery can be independent of the company's origin," ambiguously write the Brussels experts, who are apparently divided over this question of capital nationality, "but it is very closely connected, in particular, to the type of research and development activity that the company is conducting in Europe."

On the question of demand, the Commission argues for the installation of trans-European computer communications networks. These would guarantee the industry substantial orders, and for several years. Such infrastructures would be financed by the sectors concerned but with, if it comes to that, a Community subsidy. It recommends "user participation in Community programs," in order to educate and mobilize the former.

The design of Community programs should be reviewed. The Commission talks about a "second generation" of programs featuring work that is concentrated on fewer, better targeted, more ambitious objectives, and henceforth including projects that are closer to the market. The

programs will not be allowed to ignore the education of researchers and engineers, which the Community "urgently needs."

The Commission intends to implement a commercial policy that is not aggressive (it expresses some reservations about antidumping suits), but that is more present, more active. If abuses of dominant positions or discriminatory practices (very aggressive price policies or a refusal to supply components or products) by big integrated American or Japanese firms are observed, "pressure will be brought to bear on the authorities concerned." The authors, after mentioning the balance that must be struck "between international cooperation and technological autonomy," cautiously come out in favor of collaboration with the Americans.

In terms that are still very general, the Commission calls on governments to mobilize banks to improve the funding mechanisms for electronics and computer products companies with the greatest need, through, for instance, venture-capital deals.

Almost as an allusion, the Commission calls for new cooperative ventures and new partnerships between EC companies. It would be appropriate, it adds in a parenthetical clause, without specifying the ways and means, "to think about the need to make substantial industrial investments in the basic components necessary for the future generations of data processing and electronics products."

EC Commissioner Bangemann on Electronics Sector

91AN0309 Paris *ELECTRONIQUE INTERNATIONAL*
HEBDO in French 14 Feb 91 p 5

[Interview with Martin Bangemann, vice president of the EC Commission, by Michel Heurteaux: "Help Yourself and Brussels Will Help You"]

[Text] No "plans," no "sector-related schemes." The Commission in Brussels agrees to support the European electronics industry but emphasizes that the strategic choices are first of all the managers' responsibility.

ELECTRONIQUE INTERNATIONAL HEBDO: What is the EC doing to support and strengthen the European electronics industry, which is going through a difficult phase at the moment? Could specific actions be proposed?

Bangemann: In the early 1980s, the European Commission launched a strategic initiative with the help of industrialists from the electronics sector. The essential goal was to organize, at a truly European level, a sort of technological "catch-up" on the basis of research and development. Today, almost 10 years later, our R&D position has improved but the redeployment effort can definitely not stop with this field, although it is an essential one. In October 1990, the Commission

adopted, upon my initiative, a text on the industrial policy which has to be carried out at the EC level.

A sterile debate has been dividing our member states for too long into proponents of the so-called "liberal" school and those of the so-called "interventionist" school. What we are advocating is a "horizontal" industrial policy, not massive sector-by-sector intervention, so that European industry, and particularly the electronics industry, can fully benefit from the emergence of a large market of some 320 million consumers.

One thing should be clear, however: The major responsibility lies with the industry's managers. For instance, we do not intend to conceive from Brussels "plans" or sector-related support schemes; we are not substitutes for the captains of industry. Industrialists must become aware of the advantages we offer them by gradually abolishing the current internal borders. In other words, I repeat that they must learn better than in the past to utilize the size of a continental market, to rally around strategic concepts for which we place legislative instruments at their disposal (company law, European corporation, public markets, fiscal policy, etc.).

EIH: Several bodies at the national or even regional level have incentive policies to attract investments from non-EC countries. Does this not contradict the will expressed by the EC authorities to support European industry?

Bangemann: There is no EC regulation which allows a priori exclusion of investments, either by European firms or by non-European ones. Any investment in the EC is in fact welcome, provided it meets the aid criteria in effect in the Community. Rejecting the investment from a non-EC company would provide additional ammunition to those who argue that the idea of the 1992 single market is actually disguised protectionism.

There is no contradiction whatsoever between this concept and the industrial policy that we wish to conduct. On the contrary: Psychologically, European investors have understood the advantage of the single market since they have widely anticipated the 1992 phenomenon. By way of example, I will give you a figure: In 1988, economic growth in the EC was up 3.7 percent as compared with the preceding year.

Now, our experts have calculated that one-third of this result was due to increased investments by companies which have anticipated decisions well ahead of the establishment of the single market. They again perceived Europe as a chance for development, which is quite a change from the sullen atmosphere of the first half of the 1980s, when there was a lot of talk of "eurosclerosis" or "europessimism."

EIH: Since Japan and the United States do not offer aid or subsidies to foreign firms wishing to settle, Europe appears to be quite "charitable."

Bangemann: I'll have to point out to you that these two countries do indeed promote investment, especially

through a tax relief system of which electronics companies and others can take advantage. Having said this, one major remark must be made: Those who believe that Europe is a piece of cake that U.S. and Japanese companies dig into are at the wrong address. We do not intend at all to build a "fortress" reserved solely for European companies, but in quite a few fields, we have clearly proposed regulations and legislative instruments which make it possible to implement the so-called principle of "Community preference." This is the case particularly in the government procurement markets, which we opened to European competition but for which we will not surrender to large outside competitors as long as they treat European companies inequitably.

EIH: The electronics industry will be the largest industry worldwide by 2000. With this perspective, should aid to this sector not be stepped up and a genuine industrial policy at the European level be built?

Bangemann: The Commission is currently examining the situation of this strategic sector, and I have recently met the representatives of the main associations that exist at the European level. Although we clearly do not wish to make "made-to-measure suits" for an individual sector, we will not fail to draw the strategic conclusions which are necessary in the light of this exercise.

It goes without saying that we cannot set up specific measures for individual electronics companies that encounter business difficulties.

However, it must be stated that the quality of R&D in Europe is obviously not questioned: Especially in consumer electronics, the European laboratories have developed all the major innovations from videodisk to VCR. The sad part is that they have been unable to exploit fully the commercial spin-offs of these inventions.

This is where it hurts and the question will not be solved by any "support scheme" or "financial plan;" the solution lies in larger and closer cooperation in Europe on the industrial level.

And this is primarily the responsibility of the managers of industry. If they have concrete ideas to submit to us, these ideas will be welcome.

European Electronics Leaders, EC Commission President Meet

91WS0322B Paris LE MONDE in French 22 Apr 91 p 19

[Text] The fact that the meeting was kept a secret does not make it any less illustrative of the European Commission's intention to play a more active role in grappling with the shortcomings of the European electronics industry.

On Friday, 19 April, Bull, Siemens, Thomson, Olivetti, and Philips management met together in Paris under the auspices of the head of the European executive branch, Mr. Jacques Delors. Discussions are said to have focused

on a reconquest strategy for countering Japanese and American superiority in the sector. Commission Vice President for Research Filippo-Maria Pandolfi reportedly participated in these discussions.

Brussels is being very discreet about this initiative. The principle of the meeting—while officially denied by Brussels—has finally been unofficially confirmed.

EC Framework Program Funding On Hold

91WS0275B Paris LE MONDE in French 20 Mar 91 p 25

[Article by A.K.: "European Research Funds Are Blocked"]

[Text] The Community's third Research and Development Framework Program (PCRD), which was adopted in December, 1989 and covers the period from 1990 to 1994, still cannot be implemented. The funds earmarked for it—5.7 billion European currency units [Ecu] (40 billion French francs [Fr])—are still blocked and there is now little chance that they will be made available to the recipients—researchers and manufacturers—before 1992.

A quarrel between the Cabinet and the European Parliament is responsible for the delay. Once the PCRD was unanimously passed by the Twelve, the 15 specific programs that make it up were to be adopted by a majority in the European Parliament. When the program was submitted to the Strasbourg Assembly for a first reading, the first five specific programs were amended. But the Cabinet refused uphold any of the amendments, angering the members of parliament, who threatened to refer the matter to the Court of Justice.

To put a stop to the discord, the Commission decided to withdraw the proposals relative to the five disputed programs, thereby sending the debate back to square one. Debate on the ten other programs has not yet begun.

New proposals are expected to be submitted to the Parliament in May. They could be adopted by the Cabinet by June at the earliest. Consequently, the bid invitations will not be able to be issued until the fall: The "faucets" of the third PCRD will not be able to be turned on until the beginning of 1992. That is assuming that everyone exhibits greater good will.

The Parliament's opposition seems to have been fueled more by questions of form than of content—particularly budgetary questions. The Parliament believes that it is its job to determine the budget package. The people surrounding Mr. Hubert Curien, the French research and technology minister, admit to being "worried" by the delays caused by these institutional quarrels. But the crisis also points up the need to modify the methods for implementing Community research policy, by requiring a Parliamentary debate before the Commission adopts the program.

EC Research Commissioner Favors European Semiconductor Group

91WS0322A Paris LE MONDE in French 25 Apr 91 p 29

[Article by Philippe Lemaitre: "Mr. Pandolfi Says He Favors Establishment of a Single European Semiconductor Firm"]

[Text] Brussels (European Community)—"At last we are talking about a single European firm to produce semiconductors! The time as come to attain the necessary critical mass." This exclamation was uttered Tuesday by European Community Vice President for Research Filippo Maria Pandolfi during the course of a colloquium on industrial components organized in Brussels by the European Parliament. A few moments earlier, Mr. Pasquale Pistorio, general manager of the French-Italian SGS-Thomson group, had stressed that, to stay in the technology race, Europe needed "at least [to establish] a company of an appropriate size, because none of the three major groups currently operating in the Community market reach the necessary threshold."

Mr. Pandolfi's reaction provided spectacular confirmation of the Commission's desire to encourage the envisioned alliance between Philips, SGS-Thomson, and Siemens. Both speakers had already explained that, should the Community lose control over its semiconductor production, it would be impossible to envision maintaining a European presence in the information technologies—the dominant industry of the decade—over the long haul. Neither would say how he envisioned the alliance they were calling for. Mr. Pistorio said that this was up to the shareholders and the public authorities.

Mr. Pandolfi added that this single European firm should be able to cooperate internationally, his preference apparently being for a European-American partnership. "The Japanese have such a strategic advantage that we need to be able to pool our efforts with others," he said. The Commission vice president also said that he would like to see closer cooperation among European computer makers.

EC To Boost European Supercomputer Industry

Rubbia Report

91AN0345A Amsterdam COMPUTABLE in Dutch
22 Mar 91 p 4

[Article by Robbert Hoeffnagel and Nigel Tutt: "Europe and the United States Put Money Into Supercomputer—Hundreds of Millions of Government Money for Research and Networks"]

[Excerpt] Amsterdam—The European Commission seems to endorse the idea for a European supercomputer industry as expressed recently by Carlo Rubbia, top executive at the European Center for Nuclear Research

(CERN). The United States has also decided to invest many hundreds of millions in supercomputer technology.

The European Commission intends to increase expenditure for R&D into supercomputers. Filippo Pandolfi, the European Commissioner responsible for research, stated this after receipt of a report on the subject which was prepared by a team headed by Professor Carlo Rubbia. By 1995, Rubbia and his team would like to see an annual investment of both private and government funds of 1 million European currency units [ECU] (1 ECU = 2.30 guilders).

Pandolfi: "In 1992, there will be a second allocation of funding under the third European Strategic Program for Research and Development in Information Technologies (ESPRIT). Our research efforts have reached a crucial phase and we must now concentrate on a great number of strategic projects. Supercomputing is one of these projects."

The team under the leadership of Professor Rubbia told Pandolfi that, although Europe represents some 25-30 percent of the supercomputer market, there is not a single European manufacturer of high-performance computers: "Virtually every machine comes from Japan or the United States. There are, it is true, a few companies starting up in this field, but they come up against huge problems when trying to switch to an international scale of operation. In particular, they are having problems in trying to keep up with the growth of their American and Japanese competitors."

At the same time, Rubbia found that the market is very open. Cray, for instance, has a market share of 20 percent in Japan, while Fujitsu through Siemens and Amdahl holds a similar share of the European market for its vector processors. There is therefore a "window of opportunity" for European firms, as long as they receive support from the EC Commission. These opportunities are further increased by the introduction of standardized control systems, programming languages, and user interfaces. According to Rubbia, the European Commission and industry must now work together toward the building of a supercomputer industry. As he has already stated that supercomputing is a strategic project within ESPRIT, EC Commissioner Pandolfi is willing to cooperate toward this end. [passage omitted]

Report Criticized

91AN0345B Edam SUPERCOMPUTER EUROPEAN WATCH in English Mar 91 pp 11-12

[Article: Point-Counterpoint: The Rubbia Report"]

[Text] We talked to Falk-Dietrich Kuebler, chairman of Parsytec, a successful manufacturer of transputer-based products in Aachen [Germany], about the Rubbia report. He is not pleased by the impression given by the report and thinks it overlooks a complete European industry

based on Inmos transputers. We talked furthermore to Tor Bloch, who, among many other things, is one of the contributors to the report.

Parsytec's Falk-Dietrich Kuebler says, not without irony, that the whole report "looks at things from an extremely high level, a third of it is filled by curriculum vitae, so the view for details may be lost." The basic importance of high-performance computing and specifically the teraflop/s issue, he observes, is addressed in the right way. But, to him, there is a real danger that the general spirit behind the document will be understood as: "We cannot do it in Europe, the race with the Americans is a horror picture for us, and as a consequence, please, give us ECU1 billion per year and we will start with American technology and will correct the situation."

We Cannot Do It Completely Alone in Europe

One cannot live independently from the outside world, observes Tor Bloch. If you try and build up a basic industry, as Inmos has successfully done from scratch, that is fine, but, if you do that for supercomputing in general you have to build up parallel expertise, packaging expertise, compiler expertise, adapt high-speed semiconductor production lines and a few other things. "Nobody has the patience to do that, certainly not in the sense of throwing money at it."

Horror Picture

"The picture is pretty negative," maintains Bloch and looks at the market share: the total amount of money spent in Europe on high-performance computing compared to the extremely small market share that European-controlled companies have.

Money

"I simply cannot accept," says Kuebler, "that the high level focus is shifting in the wrong direction in Europe. During the last few years the EC has proven a remarkable strategic view. With their assistance and coordination basic chip technology like the T800 and the H1 has been developed. Furthermore, the important task of dissemination has been addressed by a number of programs like the PCA (Parallel Computing Action) and others, involving both science and industry. From the beginning, unlike the U.S. and Japan, Europe has concentrated all forces on parallel processing, which, the report agrees is the single path to a real breakthrough. Ignoring what has been achieved until now would curtail the existing possibilities instead of building on them."

"The panel did not do detailed budgeting. It is clearly supposed to be extra money, it is not supposed to be taken out of current programs," says Bloch.

Defeatism

Kuebler fears that "if institutions like CERN automatically follow the recommendations of the Rubbia report and large companies (e.g., Siemens-Nixdorf, Daimler

Benz) also look at what is politically adequate, this report with its general atmosphere of loose self-confidence, will become a self-fulfilling prophecy."

Bloch is unhappy that people feel the report is defeatist. It says clearly and truthfully that Europe is not a producer of one of the key elements of economic and scientific development: high-speed scientific and technical computing systems. "It is a difficult task to explain," he comments, "why people should put so much money and effort into an area which *a priori* works well. One has to get across the fact that our industrial infrastructure is weak and that this may be a political and economic problem in the long term. The proposal is meant to solve that problem in the next decade."

For things to follow the Rubbia report, he thinks there must be a number of successful European companies—"I hope for 10 or more, but at least 5 or 6"—who become industrial players. A player is, in Bloch's definition, somebody who really develops something. (When you are a player you can choose to compete or to collaborate, if you are not a player you are at the other fellows mercy.") He does not want Europe to take over the world, but just for Europe to become a player in key technologies.

Transputers

Kuebler analysed the problem as a lot of people still seeing the transputer in the wrong perspective, "they have not yet understood its strategic importance, and may think of it as something to play with. It reminds me of the end of the 1970s when most experts considered PC-technology as an entertaining toy."

But the transputer is still outside the supercomputing scope, thinks Bloch: "Have you ever seen them winning a bid against Cray? Only in five to 10 years will highly-parallel systems become dominant."

Bloch considers various sorts of parallelism to be very important including transputers, although they are not mentioned specifically. "I cannot think of anything in the report that is against transputers." The report mentions the possibilities of thousands of relatively cheap CPUs with distributed and shared memory: "Transputers fit very well into that," he says.

"Transputers have an excellent market share with the embedded systems for which they are well suited," he continues, "and some companies (e.g., Parsytec or Meiko) have been able to develop a high-speed computing industry on top. But, you cannot live on one industry alone, you have to develop a number of industries." Unfortunately, at this moment, he sees relatively few senior people with relevant experience in Europe to do that.

EC Industry in Need of Skilled Workforce

91AN0348 Brussels TECH-EUROPE in English Mar 91
Section III, p 4

[Text] The European Community's Advisory Committee on Research and Industrial Development recently published two reports stressing the urgent need for European industry to provide itself with a scientifically and technically skilled workforce. On the assumption that productivity and competitiveness reflect to a large extent the quality of the educational system, the two reports point out that Japan produces twice as many engineers as Europe and given the present state of affairs it will be a long time before Europe can catch up with the "Land of the Rising Sun." The reports urge teaching establishments to place more emphasis on science and call for more opportunities to be created for continuous training.

The Advisory Committee says that higher investment in R&D could prove less productive than anticipated if there are not enough skilled people to develop and exploit technological innovations. After highlighting the risks involved in concentrating on one area at the expense of another, the report proposes a series of measures that should be introduced throughout the Community.

The threat of a serious shortage of skilled engineers and technicians is so severe that unless immediate action is taken by all levels of government, by all sizes of companies and by the whole educational system, Europe's struggle to achieve competitiveness in the coming years will be lost. The committee admits that in general the educational standards attained by the latest crop of graduates is generally satisfactory but says that there are not enough of these graduates. It also stresses the need to improve the technical expertise of people who are already at work. In other words, continuous training should become a key element in the educational system of European countries.

Educational and training activities in Europe are said to be carried out on a piecemeal basis and are woefully unproductive. Hence the need to promote remote learning and, generally speaking, any arrangement that helps to make teaching and training activities less rigid. The lack of standardised teaching programmes and the high cost of multi-media teaching materials are cited as major obstacles to better training. It is also suggested that more emphasis should be put on general science courses as the only way of training individuals to adjust to the march of technological progress.

The committee welcomes the results achieved by the Comett (Community Programme for Education and Teaching in the Field of Technology) programme to promote cooperation between the business and the academic worlds. This type of initiative needs to be extended and it could be particularly helpful in combating regional imbalances caused when skilled people leave one area in favour of another.

Another suggestion of the committee is that each European-wide R&D programme should be flanked by a follow-up training programme in order to ensure that the potential usefulness of the research work is not wasted.

The experts of the Advisory Committee also believe that more information on training needs to be made available and they urge the Commission to carry out studies to ensure consistency in training schemes and to analyse and project trends in demand for skilled labour, particularly in smaller companies. The experts also advocate starting up a wide-ranging study on the cost to industry of not investing enough in education.

The committee feels that all young Europeans should leave school with some basic knowledge of science and technology and they suggest these subjects be accentuated more in the educational system.

More efforts are needed to attract women into the world of industry. Young people in general are said to be put off by the idea of making a career in scientific or technological fields, thus a study needs to be conducted to find out what image young people have of industry so as to find out how to make the sector a more attractive proposition for school leavers. The committee suggests that pilot schemes should be launched with a view to involving teachers more in the scientific and technological disciplines. Attention also needs to be paid to the possibility of student teachers spending one or two years in a company environment before qualifying as a teacher.

EC To Open Anti-Dumping Inquiry of South Korean DRAMs

91AN0396 Brussels TECH-EUROPE in English Apr 91 Section III pp 11-12

[Article: "Anti-Dumping: Commission Takes Action Against South Korean DRAM Memories"]

[Text] Following up a complaint filed by the European Electronic Component Manufacturers Association (EECMA), the European Commission has decided to open an anti-dumping inquiry into EEC imports of dynamic random access memories (DRAM) from South Korea.

According to the EECMA, some South Korean manufacturers are exporting DRAM's at prices lower than those quoted on their domestic market, causing serious harm to EEC manufacturers. South Korean DRAM exports rose from 0.3 million units in 1988 to 4 million units in 1989, which meant a fivefold increase in South Korea's market share, from 1.43 percent in 1988 to 7.55 percent in 1989.

Although the share of the DRAM market held by manufacturers rose between 1988 and 1989, the EECMA claims that this share would have increased a great deal more if imported South Korean DRAM's had not been dumped on EEC markets. The complaint also points out

that the positive benefits from anti-dumping measures taken against imports of Japanese DRAM's have been cancelled out by South Korean dumping.

The impact of the situation in the EEC has been an erosion of prices and financial losses, a fall in investment and production plans as well as job losses. The EECMA also claims that production stocks held in the EEC increased sharply between 1988 and 1989. Moreover, South Korean exporters of DRAM's are building production plants with capacities that far exceed current needs on their domestic market.

The Commission states that there is sufficient proof to open an inquiry. The interested parties—Samsung, Hyundai, Goldstar, and Inter Company of South Korea—have until April 6, 1991 to submit their views to the European Commission.

New EUREKA Projects Proposed

91AN0263 Amsterdam COMPUTABLE in Dutch 8 Feb 91 p 2

[Article: "Three Major IT Projects Submitted Within Framework Of EUREKA [European Research Coordination Agency]"]

[Text] The Hague—Late last week the EUREKA High Level Group, which consists of top officials from the EUREKA affiliated member states, selected 23 project proposals which will be submitted for approval to the EUREKA Council of Ministers. A spokesman from the Ministry of Economic Affairs announced that these project proposals include three major projects in the field of information technology. The overall project costs amount to 205 million European currency units [ECU], which corresponds to 475 million guilders. So far, no information has been released about the exact content of the selected projects.

The consultation within the High Level Group must be regarded as the "official preparation" of the decision-making process to which EUREKA projects are subjected. The actual decisions will have to be made by the EUREKA Ministerial Conference, to be held in The Hague by mid-June.

The projects proposed this time include many environmental and biotechnology projects. Out of the 23 projects, seven involve a Dutch participant. At present, 82 Dutch companies and institutes are participating in as many as 369 projects. The largest EUREKA project is the Joint European Submicron Silicon Initiative (JESSI), supporting cooperation in the area of advanced IC technology. Partly on the initiative of the Netherlands, which will continue to preside over EUREKA for a few more months, attempts are being made to give more impetus to the High-Definition Television project within the framework of EUREKA. How this reactivation will be handled was also discussed during the latest meeting of the High Level Group.

EUREKA Program Evaluated

91ANO381 Amsterdam *COMPUTABLE* in Dutch
12 Apr 91 p 1

[Article by *COMPUTABLE* correspondent: "Evaluation Committee Advises New Course: 'More Eureka Funding For Megaprojects'"]

[Text] The Hague—According to an evaluation committee headed by former Philips top executive prof. Wisse Dekker, EUREKA should make more funds available for megaprojects that can drastically change Europe's technological infrastructure. More large-scale, strategic projects, similar to the Joint European Submicron Silicon Initiative (JESSI), HDTV, and Cooperation for OSI Networking in Europe (COSINE), should be introduced.

Furthermore, procedures for approving a project by the individual member states should follow along more equal lines. Because projects are financed by the participating countries, one country sometimes allocates subsidies much more slowly than another. This leads to unnecessary delays, according to Dekker. The evaluation committee is to officially announce its conclusions on 18 June at the EUREKA ministerial conference in The Hague. Nearly half of all EUREKA projects deal with information technology applications and electronic equipment.

The annual EUREKA conference is also to provide more clarification concerning the possibility of East European countries joining EUREKA. This was announced at a press briefing last Wednesday in preparation for the ninth EUREKA ministerial conference. In view of the disparity in industrial development, cooperation with East Europe in the next few years will mainly concentrate on scientific institutes. In the foreword of the recently published EUREKA annual report, Italian Minister of Sciences Antonio Ruberti stated that West and East Europe first have to come closer before extensive cooperation can be undertaken. In his opinion, cooperation should start in education and training, precompetitive scientific research, and between universities.

Moreover, EUREKA member states have differing opinions on the issue of how East Europe is to participate in the EUREKA program. East European companies will be given the opportunity to have a "sneak preview" of the EUREKA program at an introductory meeting in Budapest next month.

To date it has not been possible to obtain a clear picture of EUREKA's results. A lot of projects have not yet yielded tangible results. For instance, the Software Use and Reuse project headed by the Italian company Sytema SPA. The so-called Sour project aims at creating a methodology, tools, and an environment conducive to software development. The project strongly emphasizes the practical aspects of software reuse.

On the other hand, the COSINE project has already led to results. The first service, which is based on the international OSI (Open Systems Interconnection) standards, is currently being installed. The EC Commission has signed a contract to provide a pan-European backbone service for data network interconnections among national research networks.

Success of ESPRIT, RACE Evaluated

91AN0284 Paris *ELECTRONIQUE INTERNATIONALE*
HEBDO in French 21 Feb 91 p 8

[Article by Michel Heurteaux: "ESPRIT and RACE Programs: European R&D in Its Third Phase"]

[Text] The budget for the Third Framework Program is 5.7 billion European currency units [ECU]. With 40 percent of that budget, the European Strategic Program for Research and Development in Information Technologies (ESPRIT) and the Research in Advanced Communications Technologies in Europe (RACE) program still take the lion's share.

EC research and technology well on set course get extra boost. Six years after launching the Framework Program for Research and Technological Development, the EC has launched its third phase covering the 1990-1994 period. This third phase of the Framework Program is distinct from previous ones in that it received a much increased budget, totaling ECU5.7 billion (41 billion French francs). With a ECU3.1-billion leftover from the 1987-1991 Framework Program, the overall amount available for this third phase will in fact reach ECU8.8 billion. As within the previous phases, the lion's share of some ECU2.2 billion—just over 40 percent of the total budget—will go to information and communication technologies, chiefly the ESPRIT and RACE programs.

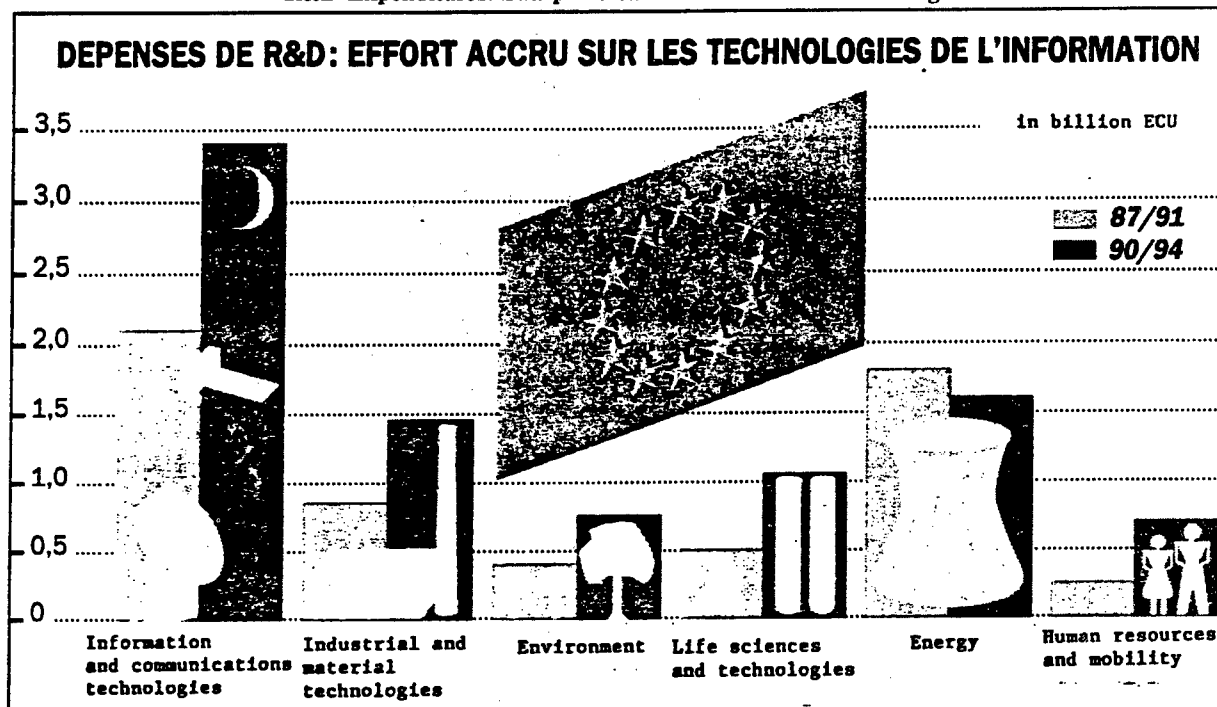
At the start of this third phase, an evaluation should be made. One has to wonder whether the heavily subsidized EC research programs have finally reached their goals. A crucial question at a time when the computer and electronics industries of the Old World are facing an increasingly serious crisis. EC support of industrial research is a much criticized policy nowadays. The champions of liberalism believe that it distorts the rules of free competition, while the advocates of a stronger commitment to industrial policies think that these subsidies are too much oriented toward upstream research and not adapted to the situation.

Maybe it has become fashionable to criticize EC programs nowadays, but many industrialists consider this criticism unjustified. "Not only have programs such as ESPRIT or RACE taught us to work together, they have also enabled us to develop partnerships around joint projects." The Brussels-based EC Commission, on its part, has recorded 152 significant projects out of the 313 listed in 1989 which have resulted in the actual marketing of new products or services. Moreover, 118 projects brought about tools and methods to improve manufacturing and production processes, and another

43 contributed to the development of international standards. It is precisely in the field of standardization that Europe is starting to score. For example, the Portable Common Tool Environment (PCTE) project, a software engineering project led by Bull, will produce software

that could, as some are hoping in Brussels, be based on one-shot alliances with American or even Japanese partners. A risky internationalization, but a possible alternative for Europe at only 700 days before the opening of its "single market."

R&D Expenditures: Sharp Increase in Information Technologies.



Another increase in the Framework Program budget, which consists of two parts: ECU2.5 billion for 1990-92 and ECU3.2 billion for 1993-94.

development tools that are used not only by European computer manufacturers, but also by IBM, DEC, and Hewlett-Packard. It is on the verge of becoming a world standard. Evidently, however, Europe still has a long way to go filling the technological gap separating it from its main competitors, be they American or Japanese.

ESPRIT and RACE showed at least one merit: that of keeping industry in the race. And if Brussels admits that the computer and electronics industries are going through difficult times, these difficulties are just as much linked to sector-related structural problems as they are to the general economic situation, with its slackening growth rates and lowering investment levels. However, this is certainly no time to give up, bearing in mind the growth perspectives offered by the European market. "Europe has excellent technological foundations," reminded Michel Carpentier, director general of the EC Commission's DG XIII [Telecommunications, Information Industries, Innovation], during a recent conference organized by the French National Association for Technical Research (ANRT). "But we are still moving too slow and do not have enough common long-term targets." Hence the obvious need to adjust the Framework Program for Research so as to stimulate a new impetus

French R&D Institutes Form CLORA Association 91AN0374 Brussels EUROPE in English 8-9 Apr 91 p 12

[Article: "Research: Inauguration on Tuesday of "CLORA" [Association of Research Organizations] Which Regroups Three Quarters of French Public Research and Lies in a European Perspective"]

[Text] Brussels (Agence Europe)—The Atomic Energy Commission (CEA), the National Centre for Agricultural Mechanisation of Rural Engineering of Waterways and Forests (CEMAGREF), the National Centre for Scientific Research (CNRS), the Management of Higher Education in Telecommunications (DEST), the French Oil Institute (IFP), the French Institute for Research and Sea Exploitation (IFREMER), the National Institute for Agricultural Research (INRA), the National Institute for Health and Medical Research (INSERM), and the French Institute of Scientific Research Into Development of Cooperation (ORSTOM), that is to say at least three-quarters of French public research, have decided to open, in Brussels, CLORA (Association of Research Organizations), whose object will be to facilitate their actions at a Community level. Each body, however, will retain total autonomy and responsibility for its actions. CLORA will have three roles:

1) Collect, shape and distribute in France information from some 100 R&D programmes managed by the European Commission;

2) Help French laboratories in their cooperation strategies;

3) Help set up a European consortium of R&D technology so as to correctly reply to offers by the Commission.

CLORA will also allow for easier contact with similar organisations in other Member States (notably the Spanish, the German—which should also be grouping inside an organisation in a few weeks—and the British—which just did so at the beginning of the month).

In presenting CLORA to EUROPE, the different managers of the organisations stressed the role, important in their eyes, of transnational partnership, difficult to set up but which will greatly contribute to Europe of the Sciences. It will, however, take time to measure the results of the Community's first research programme. The role to be assigned to the European Community is that of lever: it must provoke relations between different laboratories. Once the inter-European network has been set up, it will have to improve on its own. Progress has already been achieved along these lines. Before, only national research was considered, and contact with the United States. Now we are reacting at a European level.

France: Corporate Research Incentive Program Assessed

91AN0361 Paris RECHERCHE TECHNOLOGIE
in French Mar 91 pp 9, 11

[Article: "Taking Stock of the Technological Leap Procedure"]

[Text] The "technological leap" program, launched at the end of 1988, fits in with the effort made by public officials to provide incentives for industrial research. Its objective is to help companies financially to carry out ambitious basic industrial research projects. On 1 March 1991, 40 projects were benefiting from this program.

The "technological leap" program, implemented by the Ministry of Research and Technology (MRT), concerns ambitious civil basic industrial research projects involving a high technological risk, requiring the mobilization of significant R&D resources, and scheduled for periods of approximately five years before products are marketed or processes are implemented.

Complementing the "major innovative projects" program implemented by the Ministry of Industry and Land Management and the activities supported by the National Agency for Research Implementation (ANVAR), the technological leap program relates more specifically to the upstream phase of industrial projects.

Criteria Applied in the Selection of "Technological Leap" Projects

The decision to support a project of industrial origin is based on the opinion of a committee in which the industry, the ministries in charge of industrial policy, ANVAR, and the major public research organizations are represented. Its secretarial services are provided by the MRT.

Four principal criteria determine the Committee's opinions:

- The project must not be a mere improvement of the state of the art, but must represent a technological breakthrough;
- The company must have both the technical and the financial capacity to see the project through;
- A real market must exist for the production and marketing of the planned process or product;
- The average total cost must be around Fr20 million (taxes included) for a period of three to five years.

Sectors Concerned

In general, all sectors of the manufacturing or production industry are eligible, except for the energy, nuclear, space, telecommunications, information technology, and electronic sectors, to the extent that they have specific support programs. The projects selected benefit from a subsidy covering a maximum of 50 percent of total R&D expenditures related to the implementation of the program.

Information for Companies and Follow-Up on Projects

The Ministry of Research and Technology and the Ministry of Industry and Land Management jointly conduct information campaigns by mailing material to companies, issuing press releases, mobilizing their field services (regional delegates for research and technology, and regional delegates for industry and research), and by alerting trade organizations, organizations offering or disseminating technologies, chambers of commerce and industry, etc. In addition, to ensure implementation of the projects, meetings are organized: follow-up committees for each project with experts to assess its development, or information and stock-taking meetings with MRT officials for certain projects. These meetings enable the ministry to follow the development of work.

Since the program started, the Directorate General for Research and Technology has selected 40 projects. It is noteworthy that four of these projects, launched in 1988, are in their final phase. They concern the building industry, public works, transportation and agricultural machinery, and biotechnology.

The amount of aid granted to these projects is Fr422.7 million, or 44.4 percent of the total amount of the corresponding research expenditures (Fr951.7 million).

An Average Technological Leap

On the basis of this sample of 40 projects, a fictitious average technological leap can be described. It represents a total cost of Fr23.8 million with Fr10.6 million in state aid over a period of three years. Moreover, the project's leading manufacturer accounts for about 70 percent of the project's cost and has an average of 1.8 private

partners (18.5 percent of expenditures) and three public partners, laboratories, or organizations (11.5 percent of expenditures).

At present, for the first half of 1991, some 20 projects are being investigated and should be discussed at the next committee meetings (20 June and 10 October 1991).

Overall Balance Sheet of Technological Leaps

Sector	1988		1989		1990		Total		
	Number of Projects	Amount of Award (Fr million, taxes included)	Number of Projects	Amount of Award (Fr million, taxes included)	Number of Projects	Amount of Award (Fr million, taxes included)	Total Number of Projects	Total Amount of Awards (Fr million, taxes included)	%
Biotechnology	2	17.00	2	15.50	2	17.00	6	49.50	11.7
Building industry—Civil engineering	1	1.00	2	15.00	1	16.55	4	32.55	7.7
Agro-food industry					2	21.69	2	21.69	5.1
Optical instrumentation			4	43.50			4	43.50	10.3
Machines					1	16.48	1	16.48	3.9
Materials	6	78.97	4	35.50	4	36.28	14	150.75	35.7
Health			1	12.02	3	42.07	4	54.09	12.8
Transportation—Agricultural machinery	2	17.10	3	37.00			5	54.10	12.8
Total	11	114.07	16	158.52	13	150.07	40	422.66	100

French Civil Research Budget Cuts Detailed

91WS0269A Paris AFP SCIENCES in French
14 Mar 91 p 1

[Article: "Post-Gulf-War Research Budget Cuts"]

[Text] Paris—The Research and Technology Ministry's budget is among the least affected by the cutback requested by the prime minister as a result of the Gulf War. In fact, its shrinkage amounts to but between 1.4 and 2 percent, which is small compared to the Prime Ministry's initial request.

Through lengthy negotiations over the past few weeks, the minister, Mr. Hubert Curien, has managed to sustain the priority accorded to research in the government's general policy. His ministry's budget will thus not be cut this year by more than 200 million francs [Fr] in spending appropriations for the year and Fr349.38 million in long-term program authorizations, out of a total of Fr12 billion.

On the other hand, if one considers the BCRD [Civil Research and Development Budget] as a whole—including the budgetary allocations of the Research Ministry and other Ministries—the spending-appropriations and program-authorizations cutbacks owing to the Gulf War come to Fr930 million and Fr650 million, respectively, the Research Ministry points out.

"Fortunately, we are far from having had to meet the reductions asked of us initially: 10 percent in program

authorizations, and 5 percent in spending appropriations," says the Ministry of Research. It will now be up to the different research organizations to adapt to the budgetary slashes that were made known to them via the JOURNAL OFFICIEL of 10 March.

From the standpoint of cuts in the research budget alone, the National Scientific Research Center (CNRS) has been by far the hardest-hit (-Fr167.31 million), followed by the Atomic Energy Commission (CEA) (-Fr82.5 million); National Institute of Agronomic Research (INRA) (-Fr39.78 million); National Institute of Health and Medical Research (INSERM) (-Fr39.3 million); French Research Institute for Exploitation of the Sea (IFREMER) (-Fr35.15 million); Sciences and Industry Center (-Fr21.9 million); French Energy Management Agency (AFME) (-Fr13 million); French Scientific Research Institute for Cooperative Development (ORSTOM) [as published] (-Fr12.3 million); National Institute for Research on Data Processing and Automation (INRIA) (-Fr9.5 million); and Office of International Cooperation on Agronomic Research for Development (CIRAD) (-Fr9 million). Through the PTE [Posts, Telecommunications, and Space] Ministry's budget alone, the National Space Studies Center (CNES) budget will suffer a budget cut of Fr150 million.

France: ANVAR's Funding Operations Evaluated

91AN0342 Paris COURRIER ANVAR in French
Mar 91 p 2

[Text] The upward trend which started in 1989 was widely confirmed in 1990. In line with the French

Government's wish to make innovation a priority, the National Agency for the Implementation of Research (ANVAR) saw its working funds increase and the agency was able to intervene, by virtue of aid to innovation, to the tune of 1,415 billion French francs [Fr] in 1990, as compared to Fr1,330 billion in 1989.

Out of Fr1,415 billion in 1990, Fr1.24 billion went to innovative enterprises distributed as follows:

- Fr1,022.3 million for 1,210 grants to corporate innovation projects;
- Fr80.2 million for 440 grants to hire researchers;
- Fr106.3 million for 1,000 grants to corporate innovation services;
- Fr35.3 million for 16 grants to enterprise transfers.

The substantial increase in the average subsidy level granted to corporate projects (roughly Fr890,000 per project compared to Fr887,000 in 1989) reflects, on the one hand, the implementation of more ambitious projects involving, in 40 percent of the cases, a partnership. On the other hand, it corresponds to changes at the level of the sizes of recipient companies (36 percent of the total was allocated to companies with 100 to 1,000 people, as compared to 29 percent in 1989).

As for grants to innovation services, the growth in the total amount is due to the establishment of a subsidy scheme for European technological partnerships (25 dossiers for Fr15 million) and to the launch of a technological dissemination network (356 transactions worth Fr11 million). A greater use of services situated more upstream of innovation projects should also be noted.

Frances's High-Speed Research Network Launched

*91AN0313 Paris RECHERCHE TECHNOLOGIE
in French Feb 91 pp 8-9*

[Article: "The National Telecommunications Network for Research Is Born"]

[Text] A memorandum of understanding for the implementation of the National Telecommunications Network for Research (RENATER) was signed on 5 February by Lionel Jospin [minister of state for education and research], Paul Quilès [minister of post, telecommunications, and space], and Hubert Curien [minister of research and technology]. It is a national high-speed network for research and technology (2 million bits per second at the end of 1992, to be progressively increased to 20 million), interconnecting public research institutes and organizations, which will also be open to industrial research and development centers. Its operational inauguration is planned for sometime in 1992.

At the request of the three ministers, France Telecom has been awarded the construction and the operation of the network. Engineering studies should be completed by next June.

What the Network Will Offer

—Communications tool. The national network will give the entire scientific community real-time access to computer facilities, data bases, and computerized libraries which it requires for its daily work. The already existing hook-up to the network of various laboratories will strengthen cooperation among teams. The network will also strengthen cooperation—already begun—between public research carried out in public institutes and universities and private research done by private laboratories and industry.

—In addition, remote access made possible by the network to computer facilities offered by centers equipped with supercomputers will encourage the use of digital modeling in several disciplines, thereby reducing the costs of often costly experiments. This trend, which is already highly developed in the fields of plasma physics, fluid mechanics, and astronomy, should be reinforced in life sciences and, especially, in climatology.

—Finally, the introduction of the network and the services it will offer will boost the ongoing technological transformation toward a better dissemination of computer facilities through the availability of ever more powerful workstations and the development of large application-specific machines.

Integration-Oriented, Efficient Network

Designed in an open-minded spirit to allow, in accordance with the recent law on the regulation of telecommunications, access by industrial research and development centers, the aim is to integrate this network with existing or future international networks.

—It will interconnect the existing networks throughout the country and will make it possible to provide higher-capacity services;

—It will foster the development of new cooperative working methods capable of strengthening the interdisciplinary nature of French research while reinforcing the exchanges.

Subject to the provisions of the PTT Code, the network will allow the interconnection of major research centers, university establishments, and existing regional networks.

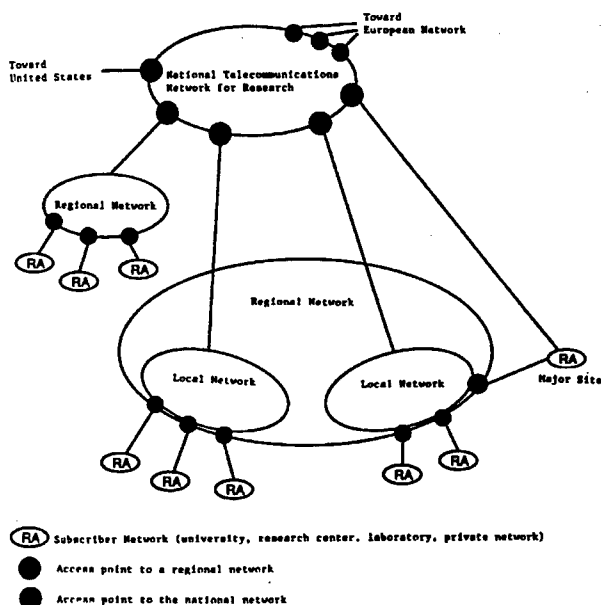
Users of high-speed regional networks currently being put in service will be given access through gateways to be installed between these networks and the future national network. Thus, research centers will obtain an efficient interconnection via regional networks and the national network.

A coordinating committee, including members of the Ministry of Research and Technology, the Ministry of

National Education, the Ministry of Post, Telecommunications, and Space, and of France Telecom, will be responsible for monitoring the sound implementation of the protocol.

Architecture of the National Telecommunications Network for Research

ARCHITECTURE DU RÉSEAU NATIONAL DE TÉLÉCOMMUNICATIONS POUR LA RECHERCHE



[Box, p 8]

The National Telecommunications Network for Research and the Integration of Europe

This network will enable France, at the end of the decade, to occupy a leading position among the countries equipped with an all-optical network supporting the most modern services. To achieve this, it has been decided to employ the fiber-optic equipment of France Telecom's national interurban network, with the goal that it be fully optical at the end of the century. Optical technology will allow a network to support very-high-speed digital services. The Telecommunications Network for Research plans to provide this type of services using France Telecom's infrastructure.

In addition, the Telecommunications Network for Research seeks to constitute the French link in a standardized European research network. It will therefore be accessible to other comparable networks that may exist at the international level.

The establishment of such standardized networks at the European level was proposed by France when it chaired the European Council of Ministers at the end of 1989.

It is in compliance with this proposal and with a view to its prompt implementation that France is now endeavoring to create the Telecommunications Network for Research.

France is pursuing the same goal by participating, at the European level, in the interconnection of the ISDN facilities of the various countries. This was done, for example, last December with Germany between the two national telecommunications organizations France Telecom and Deutsche Telekom.

French Industry Minister Announces Aid to Electronics Sector

91WS0297A Paris AFP SCIENCES in French 4 Apr 91 pp 17-19

[Article: "New Decisions for Future of French Electronics"]

[Text] The government, responding to the extremely disappointing results posted in 1990 by France's two biggest electronics groups, Bull and Thomson, unveiled on 3 April the broad outlines of a new policy for the electronics industry. Following is the relevant passage from the Council [of Ministers] communique:

The Ministry of Industry and National Development presented a report on the electronics industry.

Electronics is a strategic industry which by the year 2000 will represent about 10 percent of the world's gross domestic product. But the electronics industry in Europe is going through a difficult period. In this sector, the trade balance of EEC member states amounted to \$34.2 billion in 1989. Several major European groups reported losses in 1990.

In competing with the Americans and Japanese, the European electronics industry is disadvantaged by reason of its great dispersion and an excessively weak position in its domestic market. Two other factors also contributed to reduced corporate profit margins in 1990: the slowdown in growth, and changes in monetary exchange rates.

To redress this situation requires competitive conditions which allow European manufacturers to enjoy the market shares they ought to have. It is also necessary to encourage European cooperation and increase funding for research. This strategy will enable us to build on our industrial strengths.

In that context, the government's priorities are the following:

1. Complete the European high-definition television [HDTV] project. Six-hundred million French francs [Fr] will be earmarked for HDTV in 1991, of which Fr430 million will go to Thomson under the latter's multiyear contract. Thomson's capital will be augmented by close to Fr2 billion in 1991.

2. Prepare for the future in the computer domain. The Bull group, whose profit-and-loss picture has sharply deteriorated, launched a reorganization plan in November 1990. This plan is based on planned research and development outlays totaling Fr14 billion, of which the state, between 1991 and 1994, will provide Fr2.7 billion under a multiyear contract.

Over a two-year period, Bull will also benefit from a Fr4 billion capital infusion, 2 billion of which is to be provided in 1991 by the state and France Telecom. Taking into account the Fr1.5 billion shareholder advance it received in 1990, Bull's capital will thus be augmented by a total of Fr5.5 billion over a two-year period.

3. Increase cooperation between France Telecom, Bull and Thomson. France Telecom, as a shareholder in Bull and Thomson, will be prevailed upon to contribute to the endowments decided upon for 1990 and 1991. By virtue of its interest in computer and electronics developments, France Telecom is disposed to reorient its involvement toward joint ventures with these companies.
4. Continue with the development of communications equipment technology, in accordance with guidelines established by the government in late 1990.
5. Support industrial research in components. Fr700 million will be earmarked for this purpose in 1991, among other things to finance the JESSI [Joint European Submicron Silicon Initiative] program and contribute to the research activities of SGS-Thomson.
6. Formulate a broad European technology plan for automotive electronics, including driver assistance systems to improve safety and traffic management.
7. Ensure the dissemination of electronics technologies through a Fr900 million allocation to research and development activities of the PME's [small- and medium-sized enterprises]. In all, the Ministry of Industry in 1991 is devoting in excess of Fr2.4 billion—more than half its industrial research appropriations—to the electronics industry.

In his report, Mr. Roger Fauroux said European industry was "too dispersed" and that its domestic market was "more open than that of its competitors." In 1990, the effects of these handicaps were aggravated by the slowdown in growth and by adverse changes in monetary exchange rates.

Although France may pride itself on being well-positioned in certain areas of the electronics industry—telecommunications, software, and industrial electronics—the same is not true for other branches in the sector.

For example, the computer manufacturer Bull lost Fr6.8 billion last year, and TCE, Thomson's "consumer electronics" branch, lost Fr2.7 billion. The government is nevertheless obliged to support these two companies,

Mr. Fauroux said, because electronics "conditions the future competitiveness of entire branches of industry" in Europe.

The measures adopted by the Council of Ministers, already widely reported in the press over the last few weeks, are intended to recapitalize Bull and Thomson. Bull will receive Fr4 billion in fresh capital over a two-year period (half of it in 1991), in addition to the Fr1.5 billion advance already disbursed in 1990. Thomson, for its part, will receive nearly Fr2 billion in 1991.

In connection with the two capital augmentations, the public telecommunications company France Telecom will contribute enough new capital to maintain its current 17-percent interest. The objective is to develop a real "partnership" between France Telecom, Bull and Thomson in order to exploit the possible synergies.

The two groups will also receive increased state support for their research activities: Fr600 million will be earmarked for HDTV in 1991, including Fr430 million provided under the multiyear contract between Thomson and the government. The latter will also provide Fr2.7 billion toward the Fr14 billion cost of Bull's 1991-1994 research program.

Mr. Fauroux also noted that the government will allocate Fr700 million for research in the components field this year. More than half the Industry Ministry's research budget (some Fr2.4 billion) is destined for the electronics sector.

France is going to try to ensure that European manufacturers enjoy domestic market conditions as favorable as those of their competitors. The written text of Mr. Fauroux's remarks says that "the European market must not be transformed into a field open to attack from any direction." It will also be necessary "to strengthen research and European cooperation," Mr. Fauroux added.

Sources in the ministry object to calling this set of measures a "plan." The history of the French electronics industry in France has been marked by a succession of plans that have cost the treasury a great deal, from the very costly computer plan of the 1960's that gave birth to CII [International Data Processing Company] (Bull's forerunner), to the "computing for everyone" plan of the Fabius government.

At a press conference, Mr. Fauroux left the door open to the possible acquisition by the Japanese computer company NEC of an ownership position in government-owned Bull, though only a small one "on the order of a small fraction." Such participation "is conceivable," in that NEC is already a 15-percent shareholder in the French group's U.S. subsidiary, Mr. Fauroux indicated, though "nothing has been decided."

The deal now being studied by the ministry would provide for NEC's stock in the U.S. subsidiary (Bull H.N.) to be converted into capital shares in the group's

mother company. Bull officials want to maintain financial ties with the Japanese manufacturer because the latter supplies the French group with most of its main-frame computer technology, observers note.

The strategy adopted to save Bull is "not the one chosen by Mrs. Thatcher," who allowed ICL, the largest British computer company, to be taken over by Japan's Fujitsu, Mr. Fauroux added. The minister admitted that a link-up with some other European computer manufacturer was not possible at this time.

In defending the steps taken by the government to assure the survival of this "strategic sector," Mr. Fauroux pointed out that Bull, the ninth largest data processing group in the world, is one of the "last European survivors," along with Germany's Siemens-Nixdorf, Finland's Nokia and Italy's Olivetti.

France: CNES Budget Cuts Predicted No Threat to ESA Programs

91WS0334 Paris LE MONDE in French 2 May 91 p 22

[Article by Jean-Francois Augereau: "In Spite of Budget Cuts, the National Center for Space Studies [CNES] Maintains European Programs Priority"]

[Text] Priority to Europe, but not at any price. It is out of the question to allow two of the ESA [European Space Agency] leading programs—the Hermes shuttle and the Columbus orbital station, one section of which will be grafted onto the future U.S. Freedom station—to perturb the delicate balancing act performed by CNES [National Center for Space Studies] officials on the 1991 budget. There must not be any cost overruns on these two programs—representing about 70 billion French francs [Fr]; this is not an easy task for a program like Hermes, as "the Hermes object is defined at the same time as the technologies from which it will stem."

It is therefore no surprise if the venture is risky and if the CNES, which finances most of it, has stated that, if need be, these programs could be spread over a longer period should excessive technical difficulties arise. Although it was granted a rather large budget for 1991 (Fr10,261 million, inclusive of all taxes), i.e., 9 percent more than last year, the CNES actually feels hemmed in, as it was hit by recent budget cuts: Fr190 million in program authorizations and Fr150 million in payment credits.

The French-German Agreement

According to the CNES managing director, Mr. Jean-Daniel Levi, these budget cuts represent "a severe effort demanded of the institution." Actually, it is difficult to modify European programs. It is also difficult to cut back on bilateral cooperation. Finally, it is difficult to hit the CNES R&D program, which was increased by 18 percent to make up for all too lean years. Therefore, talks on the nature of the cuts go on between the CNES and its supervisory authorities.

In spite of these problems, Mr. Levi has an increased budget that many European space agencies might envy. It is not without reason that France has been the European leader in space for decades. Therefore, it is not surprising that most of the CNES budget is spent on ESA programs (42.94 percent) with bilateral cooperation (6.42 percent) lagging far behind, while national programs get 23.02 percent, technical functional program support 15.88 percent, and the CNES general operating budget 11.74 percent.

Despite these few adjustments, the CNES budget remains consistent. Budget cuts are certainly hard to manage, but they are also small enough to prevent France's European partners from getting the impression that Paris is giving up its commitment at a time when Europe's space policy has reached a turning point (LE MONDE, 24 April). In fact, the European space ministers will probably meet in Bonn (Germany) around 10 July to launch for real the Hermes and Columbus programs.

It will not be an easy task, but the many contacts maintained between France and Germany should provide a strong base for this international conference. Certainly, the Germans are advocating large-scale economies on European programs. Nevertheless, the CNES assistant managing director, Mr. Daniel Sacotte, remains confident and claims that today "the two countries have gone a long way to bring their points of view together." There remains the task of persuading smaller European countries—which are sometimes annoyed by the Paris-Bonn tandem's policy of fait accompli—that the decisions made were the right ones.

France To Boost Electronics Industry Funding

*91AN0398 Chichester INTERNATIONAL
TELECOMMUNICATIONS INTELLIGENCE
in English 15 Apr 91 p 4*

[Text] Calling for stronger EC policies to support EC technology companies, the French government is providing 6 billion French francs [Fr] of fresh capital to its electronics industry. With United States and Japanese competition looming, the EC industry minister Roger Faroux said the European market should not be allowed to turn into "a territory open to all winds" and called for strict reciprocity on market access between the EC and third countries.

The French government will provide Fr4 billion over the next two years for Groupe Bull, the state computer manufacturer, and nearly Fr2 billion this year for Thomson, the ailing consumer and defence electronics group. Of the Fr6 billion total, 17 percent will come from France Telecom, which holds minority stakes in both companies and which has made no secret of its unwillingness to take part.

In addition, Bull is to get a Fr2.7 billion contribution to its research budget over the next four years, bringing to

Fr6.7 billion the total of grants and fresh capital it is getting from the government.

At the same time, the Industry Ministry has set aside Fr2.4 billion, more than half its research budget this year, for electronics. The money will go to Thomson's work on HDTV [high-definition television], joint European research into semiconductors, and support for small company research and development.

Groupe Bull posted a Fr6.8 billion (\$1.19 billion) net loss for 1990—one of the largest annual losses ever made by a computer company—compared with losses of Fr267 million in 1989. A slight increase in sales for 1990 was reported to Fr34.6 billion, from Fr32.7 billion in the previous year.

French Semiconductor Programs Face Financial Difficulties

91WS0344 Paris L'USINE NOUVELLE MAGAZINE
in French 2 May 91 p 27

[Article by Jean-Pierre Jolivet: "The Two French Semiconductor Programs Are Marking Time; Grenoble's Chips Ran Out of Money"; first paragraph is L'USINE NOUVELLE introduction]

[Text] CNET [National Center for Telecommunications Studies], LETI [Laboratory for Electronics and Data Processing Technologies], SGS, and Thomson—partners in several projects—are still waiting for the public manna.

The Grenoble "silicon valley" is down in the dumps. While European manufacturers in the sector are closing ranks around Jacques Delors, while the French government attempts to rally other States to the idea of a European industrial policy, the development of the new generation of semiconductors has come to a halt. Money is not coming in. At a time when veritable survival operations have been decided, the two large French programs are marking time... for lack of money.

GRESSI, the economic interest group associating the Norbert-Segard Center of the CNET with the LETI (the CEA [Atomic Energy Commission] microelectronics laboratory), which is expected to develop submicron technologies (0.35 and 0.25 micron) by 1995, has trouble setting itself up... one year after its creation.

Objectives Diverge

First, there is no money: the 90 million French francs [Fr] of the 1991 budget (the first budget) are long in coming. It is hard to get money out of the Ministries of Research and Industry, which are supposed to finance the LETI's share, although the State just allocated close to Fr4 billion to Bull and Thomson. "If the ministries can't agree very soon, the credits may be postponed by one year," Max Verdone, the GRESSI director, fears.

Then, there is a cultural difference: although the agreement was recently broadened so it would better reflect

industrial realities, the partners' objectives still diverge. Some observers even speak of a conflict. The CNET does not conceal its determination to engage in basic research on semiconductors, leaving the development of manufacturing processes to the Grenoble 92 program; the LETI, on the other hand, traditionally privileges applied research. "The development of manufacturing processes will have to take place at a more advanced stage, in particular at the industrial stage," Jacques Lacour, director of the CEA microelectronic strategies, advocates.

The other large program, Grenoble 92, which associates the CNET and SGS-Thomson and provides for the creation of a development center dedicated to the industrialization of chips obtained in 1-micron technology, is not much better off. Its Fr1.2-billion financing is lagging. In particular on the part of SGS-Thomson, which is supposed to provide the Fr300 million required for the buildings. As a result, the first chips will not be ready as expected by 1992.

These delays are having serious consequences. Especially as the German government has just frozen Fr170 million in aid to JESSI [Joint European Submicron Silicon Initiative]. Precisely when Europeans are wondering whether they should go on with the JESSI research program.

France: Atomic Energy Commission Budget Increased

91WS0269B Paris AFP SCIENCES in French
14 Mar 91 pp 22-24

[Unattributed article: "Approximately 20 Billion Francs for Atomic Energy Commission in 1991"]

[Text] Paris—The Atomic Energy Commission [CEA] budget for 1991, totaling approximately 20 billion francs [Fr]—Fr19.82 billion, to be exact—shows a "slight increase," up 1.2 percent, over that for 1990, which for its part had represented a decline, according to an 11 March release by CEA Managing Director Philippe Rouvillois.

This budget "could have been worse," says Mr. Rouvillois, "but also somewhat better, had we been able to avoid the budgetary cuts that are still under discussion. We have laid out our priority avenues of research. We expect to know before summer whether the government will undertake long-term financial commitments in our regard for the future, enabling us to advance beyond these immediate priorities."

Allocations to the civil and military sections of the (20,000-employee) CEA's total 1991 budget are proportionally equivalent, but, compared to last year's levels, the civil section is up 3.3 percent to Fr9.914 billion, and the military section down 0.6 percent to Fr9.916 billion. State subsidies represent 99.4 percent of the military budget, but only 64 percent of the civil budget, with

external revenues—mainly through its subsidiary CEA Industrie—accounting for the remaining 36 percent of the CEA's civil budget.

State subsidies through the Ministries of Defense, Industry, and Research make up 80 percent (Fr 16.18 billion) of the CEA's budget. The rest comes from contributions by EDF [French Electric Power Company], FRAMATOME [Franco-American Atomic Construction Company] and COGEMA [General Nuclear Materials Company] (5 percent, or Fr1 billion) for work done on reactors, the dismantling of nuclear plants, the nuclear fuel cycle; fees and charges for products and services performed for the account of industrialists, research organizations, and administrations (10 percent, or Fr2 billion); dividends from CEA Industrie (36,000 employees); and other items (3 percent, or Fr600 million).

In keeping with its scientific orientation, the CEA will pursue its work on:

- the reactors that will be needed by the start of the 21st century, allocating Fr1.152 billion (+2.8 percent) to this activity this year;
- the nuclear fuel cycle (Fr1.603 billion, or +5 percent);
- nuclear safety and protection (Fr999 million, or +2.9 percent).

This year, Fr1.172 billion will be devoted to advanced technologies, with particular regard to proven military fallouts in optronics, funding for which is being increased by 11.4 percent.

According to information furnished by Mrs. Veronique Hespel, financial director, funding for basic research will be increased by "slightly less than the rise in cost of living: +2.7 percent for materials science (Fr1.597 billion), +2.1 percent for life sciences (Fr360 million). Funding for operations under joint international programs is being increased from Fr10 to Fr14.5 million. And Fr206 million (+12.4 percent) are being allocated to education and training."

There is no question whatever in the minds of Mr. Rouvillois and Mr. Bernard Tinturier, director of long-range planning, that bids on new nuclear power plants and nuclear installations must include the cost of their dismantlement and of the reprocessing and storage of their waste products. Hence, continuation of the work being done on enhanced reprocessing (Fr15 million this year), deep storage, and maintenance of the Superphenix supergenerator as a "research tool on the economic potential of this approach."

In this regard, however, says Mr. Rouvillois, the fact must be faced that "neither the current generation of this reactor nor the one that follows will be industrially operational systems. That point will not be reached until 2010 or 2020." For the rest, the CEA plans to continue its policy of renewing its personnel and upgrading their qualifications. "We have departures totaling 800 a year,

including early retirements and involving high costs, but we recruit 400 new employees annually, making us the leading recruiter among French research organizations."

German Research Minister Favors Joint R&D With Japan

91MI0240 Duesseldorf HANDELSBLATT in German
11 Mar 91 p 9

[Excerpts] At the end of his talks with Korean and Japanese government officials, Federal Minister of Research and Technology Heinz Riesenhuber called on German industry to strengthen its competitiveness by both manufacturing and carrying out research and development in Japan. They could even participate in state research projects, thereby taking the offensive in exploiting the strategies and technologies being developed by the Japanese. [passage omitted]

According to Riesenhuber, while in Japan he had paved the way for an expansion of the range of German-Japanese joint research projects. An agreement on bilateral scientific and technical collaboration has been in existence since 1974. However, talks with the Japanese currently focus on various joint international research projects:

- The construction of a nuclear fusion plant for power generation; besides Japan and Europe, the United States and USSR are also involved. A working party was set up in Germany for the concept development phase, which has now been completed. The Japanese have expressed the desire to host the next phase, which will be devoted to fusion equipment engineering and design, in Japan. Talks on where the work will be continued will take place shortly.
- Riesenhuber made it clear in Tokyo, however that there was strong interest in keeping the team in Germany, which is also fighting French, American and Japanese competition to have the plant built in Karlsruhe. The overall project has a 10 billion Deutsche mark budget.
- The Human Frontier science programs (including genome analysis and brain research): Riesenhuber said that the project, instigated by Japan, had grown into an attractive international division of responsibilities for all participants, with various priority areas. The initial Japanese intention had been to recover lost ground in biotechnology.
- Basic research: Although the level of overall R&D spending, equivalent to 2.9 percent of the gross national product, is similar in both Japan and Germany (the old Federal Republic), Riesenhuber says that Germany still invests considerably more in basic research. Spending on basic research thus accounts for 19 percent of total R&D costs in Germany, as opposed to only 13 percent in Japan.

During his talks with the Japanese Ministry of Economic Affairs (MITI) in particular, Riesenhuber called for integration of individual strategies at the international level to overcome central problems, such as the greenhouse effect. While he was in Tokyo he also asked Japan to adopt German CO₂ emission reduction targets. The main priority, however, was international coordination in applying existing technologies and the further development of processes that will bring this target appreciably closer.

Another issue discussed with MITI was long-term scientific strategy in industry. Riesenhuber emphasized that only the creation of German R&D facilities with their own research staffs in Japan would make Germany eligible to become an insider and to take part, for example, in MITI projects. There was already a substantial involvement on the part of the German chemical industry, and Daimler-Benz and Siemens were beginning to think along similar lines.

Stressing that a strategy of cooperation and competition must be pursued, Riesenhuber quoted as an example the European JESSI [Joint European Submicron Silicon Initiative] project on the development of the 64-megabit chip, which will also create links between Europe and other continents. Europe must acquire a strong independent position in this technology and not rely on its strongest competitors. This would be dangerous, insisted Riesenhuber, referring to the German mechanical engineering industry's experience at the beginning of the eighties, when companies could not obtain the most advanced chip generation, which was already available in Japan, owing to a supply embargo.

Emphasis Shifts in German Research Budgeting

91P60178 Frankfurt/Main FRANKFURTER
ZEITUNG/BLICK DURCH DIE WIRTSCHAFT
in German 25 Apr 91 p 8

[Text] This year, the Federal Research Ministry is allocating nearly 1.1 billion deutsche marks for research in the new Federal laender. Since the ministry's 1990 budget will be increasing by only 6.8 percent, the ministry states that this means a shift in funding, from the old to the new Federal laender. In concrete terms, for right now, this may have repercussions for the economy and for West German institutes, in the form of many negative rulings.

Moreover, Federal Minister of Research, Heinz Riesenhuber, announced that stagnation and even retrogression is foreseen in funding for research at West German State research centers. This will have repercussions at large-scale research centers whose resources would be cut over the next ten years. That [information] stems from a report, concerning unification policy in the domain of research and technology, which the Federal Minister of Research forwarded to the research committee of the German Parliament.

As a new management approach, new and efficient research entities will be built up in the domain of State-level institutional funding in the new Federal laender, on the basis of evaluation by the Science Council. A suitable infrastructure and other framework conditions are to be created so that research and development can develop within the economy. Innovative approaches in the economy, at technical colleges as well as at academies are to be bolstered by means of project funding.

In the report, the Federal Research Ministry explains that the disbanding of the Academy of Sciences is still progressing. The Science Council has already published its preliminary recommendations; they were reportedly implemented. Transitional financing will be handled by the new Federal laender and the Federal government, through a liquidating agency in Berlin.

Last year, 928 State-run projects with funding totalling 285 million deutsche marks (for 1990) were funded by the Federal Research Ministry or the former GDR ministry. This year, the Federal Research Ministry is attempting to provide overall funding of 600 million German marks. Here, the focus is upon information technology and energy research as well as indirect funding measures such as research under contract, the establishment of technology-oriented firms and aid to research personnel.

According to the report, a total of 138,000 persons were employed in the centrally administered research domain of the former GDR. Of these, 86,000 were employed in the industrial sector, 36,000 were employed in three different research academies (construction, agriculture and science) and 16,000 were employed at 55 technical colleges.

Germany: BMFT Evaluation of Eastern Laboratory Draws Criticism

91WS0358A Stuttgart BILD DER WISSENSCHAFT
in German May 91 pp 32-35

[Article by Hans Schmidt: "Betrayed and Sold Out: Eastern Science in Upheaval"; first paragraph is BILD DER WISSENSCHAFT introduction]

[Text] The Ministry of Research and the Scientific Council are hastily pushing through the dissolution of the Institutes of the former Academy of Science. The researchers are falling by the wayside; restructuring is being carried out with a crowbar.

The drama unfolds in the countryside: A spacious, parklike area with unadorned low buildings forms the scenery; the crumbling silhouette of a run-down city, the backdrop. During the first act, the emissaries of a recently victorious great power appear on the stage and analyze what might be done with the spoils. In the second act, the wheat is separated from the chaff. A pile of ashes remains, from which a phoenix rises during the

third act, the likes of which could not have developed any better in the land of the conqueror.

The name of the play is "The Creation of the Combined German Research Landscape." It is directed by the Federal Minister for Research and Technology [BMFT], into whose hands the Academy of Sciences of the GDR with its 60 institutes and almost 30,000 employees fell upon reunification of the two Germanies.

As early as the prologue, the crushing of the giant apparatus is foreshadowed. (Article 38 of the Unification Treaty: "The research institutes will remain in existence for the time being until 31 December 1991 ..., unless they have been dissolved or transformed before that date.") Then, the Minister gave his aids an order: "The form of the transformation into a federally organized institutional landscape will be determined largely by the evaluation and recommendations of the Scientific Council." And he sent them forth.

The twenty-member "Biosciences and Medicine" research team of the Scientific Council made its way to the Central Institute for Molecular Biology (ZIM) in Berlin-Buch. The date was 8 October 1990. The Institutes in Berlin-Buch—in addition to the Molecular Biology Institute, the complex also includes the Central Institutes for Cancer Research and for Cardiac/Circulatory Research—enjoy an international reputation: They are considered the most productive facilities of the former Academy of Sciences of the ex-GDR.

Famous researchers such as Max von Laue, Otto Warburg, and Theodor Brugsch were continuing a tradition which had its origins in 1931 with the founding of the Kaiser Wilhelm Institute for Brain Research. The proud truth is: "We need not be ashamed internationally, we measure up to Western institutes," according to Prof. Klaus Ruckpaul, chairman of the Molecular Biophysics Department.

The Commission came, saw—and evaluated. That was the end of the confidence and peace of mind of the scientists at Buch. Prof. Guenter Pasternak, Director of the Institute, has become bitter: "The results of the evaluation were devastating in their assessment of the Institute and the research teams, and in the their consequences. The objective can only have been the humiliation of this institute and its people."

From the point of view of those affected, the drama of the evaluation turned into a farce, but also a didactic piece on how Western bureaucrats and experts ride roughshod over the scientists and science of the former GDR. In the horror drama, the opinion of the Scientific Council plays a central role—it determines the future of the institute at Buch and of its 1,600 employees—to be or not to be.... The position paper thus assumes fateful significance; its authors assume an obligation for special care and thoroughness.

The Eastern scientists being evaluated detected neither; they feel betrayed and sold out. In three-and-a-half days,

the experts (Western) rushed through the numerous institutes, laboratories, and clinics of the research complex to evaluate people, methods, and materials (Eastern). Many were astonished by such speed: "My Biosensor Department at the ZIM was visited by Prof. Schellenberger from Halle and by Prof. Keller from Basel," reports Prof. Frieder Scheller. "Mr. Schellenberger had 10 minutes for the five labs with 12 scientists and excused his embarrassed haste by the fact that this visit was only the prelude to discussions with scientists. Mr. Keller stated during his 5-minute visit that that was the first time he had ever seen biosensors."

The emissaries largely evaded the anxious questions of the Eastern scientists unaccustomed to such a pace. Michael Strauss, chairman of the Molecular Cell Genetics Department, was informed: "Members of the committee replied that they had the ways and means to make such assessments appropriately. I personally had the impression that some members of the committee had preconceived opinions they wanted to have corroborated."

In contrast, the BMFT demonstrated great satisfaction with the record-breaking evaluation team when it was able to report already in January of this year that the expert assessment of the public research institutes "was proceeding quickly and efficiently beyond all expectations": "With highly valuable participation of scientists from both parts of Germany and from other European countries, the total of nine research teams have so far visited approximately 80 facilities."

At first, the expectations of the molecular biologists were dampened but not pessimistic. They explained away the rapid pace of the investigators by the fact that this had only been a look at the composition of the research teams and a determination of overcapacities, but not yet an evaluation of their scientific performance. "The evaluation committee was always thought of as an organizational committee and had even said: We are evaluating structures, past and future." Prof. Gudrun Erzgraeber believed that, as did the others.

Act Two: On 30 January, the Scientific Council distributed the written conclusions of its expert committee at a public press conference; the scientists themselves were not notified until a week later. Prof. Pasternak says about the strange procedure: "I suspect that it was intentional to handle this publicly before those affected were informed."

The theme was developed for 23 pages—tersely and without mercy. The cell biologists had to learn: "These projects are for the most part marginal or not internationally competitive in terms of their research output." The verdict on molecular biophysics read: "No important results are to be found even in the work of the department of Biopolymer Physics." Theoretical Molecular Biology got its comeuppance: "It seems doubtful whether this area can be brought to an internationally competitive level."

The enzymologists received somewhat better marks for their biosensors ("a field which is being pursued with some success"), which will therefore be incorporated into the Fraunhofer Institute for Microstructure Technology of the Technical University of Berlin. The smallest department, Genetics, may even be able to prove itself in a follow-up project, as may Molecular Cell Genetics, and Molecular Human Genetics.

The "relatively good equipment of the Institutes which are located in a spacious, campus-like park in Berlin-Buch" is praised. No real estate broker could have more impressively extolled the "good local conditions," the possibility for use of the campus "for the location of appropriate industrial research activities."

The bottom line: "The Scientific Council recommends the establishment of a center for biomedical research on the campus in Berlin-Buch.... For the biomedical research center, the buildings of the former Central Institute of Molecular Biology and the former Central Institute for Cancer Research are available, as well as neighboring buildings for possible expansion.... A founding committee ... should be appointed immediately. It should include representatives of the entities providing the financing (the Land of Berlin, the federal government, industry), but above all outstanding personalities from the field of international biomedical science.

In other words: This is the end of the research tradition of Buch, the Institutes are cannibalized, low-overhead projects may be continued, the real estate is acquired with obvious joy. However, a more dismal outlook faces the approximately 1,600 employees. The new center is supposed to get by with only 350 people, who will not necessarily be recruited from the existing institutes: "The new biomedical research center should open up opportunities for competent and competitive research particularly for the next generation of scientists from the new Laender." That, then, is what the phoenix rising in the third act from the ashes of GDR research looks like.

The researchers at Buch hardly recognize themselves anymore. They see their tradition, their scientific contributions, and their reputation irretrievably disappearing. They used to consider themselves first-rate scientists: The molecular biologists are actively participating in significant research projects, such as the Human Genetic Project, UNESCO's Global Network for Molecular and Cell Biology, and the EC's Immunoclone Data Base Project. According to the international list of references, the Scientific Citation Index, only publications from the Universities of Halle and East Berlin were more frequently cited, based on the region of the ex-GDR.

"Sweeping judgments, some of them very polemic, which simply are not true, which are contradicted by too much of what we have heard before about our institute, even from abroad," complains Strauss, a member of the board of directors. Prof. Ruckpaul also had received

more respect in the past: "We had been unreservedly encouraged by English and American scientists to continue our projects."

As a precaution, all three institutes had already been evaluated by an international committee consisting of Prof. Jerzy Einhorn of the Karolinska Institute in Stockholm, London heart specialist Prof. Peter Harris, and the Director of the German Cancer Center in Heidelberg, Prof. Harald zur Hausen, who is also the president of the Association of Large Research Institutions.

After thorough investigation of the institutes, this committee came to a fundamentally different conclusion from that of the "crew" from the Scientific Council: "The scientific personnel includes teams of high international quality, and we believe that in a new political climate, with a change in the hierarchical structure and organizational style, the staff has the necessary potential." In their September 1990 report, Einhorn, Harris, and zur Hausen wrote: "It would be a great shame to destroy this unique ensemble of well-equipped labs and smoothly functioning research teams." A drastic reduction in staff would, of course, be necessary, "primarily in the service area," but even those affected do not dispute that.

The serious difference compared to the evaluation by the Scientific Council is revealed in its consequences. According to Prof. zur Hausen: "We pointed out how important is it to retain all the research positions. We felt that an evolutionary transition was necessary and desirable here, not a drastic remedy." The drastic revolution has won out.

In Buch, there is much puzzling over many discrepancies which open up a chasm between statements by the actual committee and their written report. Assistant director Prof. Heinz Bielka believes: "A lot occurred between the evaluation and the final expert report. We do not know what it was. There are some statements in the report which do not match the evaluation. Various departments which were visited are not mentioned in this expert report, whereas judgments were pronounced about departments which were never even visited—and these are, in fact, negative judgments."

Prof. Pasternak is also surprised: "The Scientific Council's report faults some departments with having no plan although this was not even inquired about."

A depressing mood is currently almost palpable at the institutes; resignation and disappointment are widespread. Hopes, plans, and projects enflamed by the changes are being abandoned. There is such a difference from the new elan, the euphoria which could be felt just a year ago at the Institute for Polymer Chemistry. The Institute in Teltow also belonged to the former Academy of Sciences.

At the end of this tragedy, the scientist are standing on the brink of a chasm. The best younger scientists are hastily fleeing the house threatened with demolition;

they are being wooed away en masse by Western companies and institutes. Irreplaceable personnel are fleeing from the institute's director: "A veritable exodus has begun here. Scheller and his team with their biosensors will no longer be at the institute; this was a group which had been a significant producer for the institute. I do not know what will be left in the end."

The others have few prospects. According to Prof. Pasternak: "These are people who in the past did not have the opportunity to participate in international scientific communication; they are the many people who were not allowed to travel, who did solid work here, who never had the chance to present themselves. Now, they are losing their jobs and because of the evaluation have virtually no chance of finding anything elsewhere."

For the scientists who have no future at Berlin-Buch, a member of the Berlin Senate gave Prof. Pasternak a hot tip: "If they can't find work in Berlin, they should move to Dortmund or Stuttgart and become pharmacy reps. And they'd better do it quickly, before they find themselves on the streets."

Curtain.

German Science Council Assesses Eastern Research Institutes

Information Technology

91MI0281A Bonn WISSENSCHAFT, WIRTSCHAFT, POLITIK in German 27 Mar 91 pp 6-7

[Text] On 13 March the Science Council approved a comprehensive survey of the six institutes forming the Mathematics and Computer Science department of the Academy of Sciences (AdW) in the former GDR. These institutes cover the specialized fields of mathematics, computer science, automation, and mechanics and at present employ a total of some 800 scientific and 500 nonscientific staff. The organizations concerned are:

- Institute of Computer Science and Computer Technology, Berlin,
- Institute of Automation, Berlin,
- Central Institute of Cybernetics and Information Processes, Berlin Division,
- Central Institute of Cybernetics and Information Processes, Dresden Division,
- Institute of Mechanics, Chemnitz, and
- Karl Wierstrass Institute of Mathematics, Berlin.

The Science Council review also considered general developments and the state of progress achieved in the disciplines concerned in the new federal laender. One of the deciding factors is the important part played by mathematics, computer science, automation, and mechanics in the economic competitiveness of a land. In spite of Western embargo policies (COCOM [Coordinating Committee for Export Controllists]) the new

federal laender have productive and well-trained scientists, many of whom have also achieved notable results in the past.

In many sectors, especially mathematics and computer science, the reforms being introduced into science and research must be used to bring the new federal laender into line with international developments and performance standards as quickly as possible. For this reason the Science Council recommends that of the six AdW institutes, the Mathematics and Computer Science branch should be maintained and continue to be state-funded, although not as part of the existing institutes, which consist of extremely heterogeneous units with few subjects in common and very little internal cooperation.

In summing up, the Science Council proposes a larger number of new working relationships instead.

1. The Science Council recommends the introduction of a number of advanced basic research studies in the universities. This applies for example to research in artificial intelligence, cognitive psychology, multicomponent dynamics [Mehrkoerperdynamik], and pure mathematics. Max Planck teams at universities and other special funding measures are recommended for integration into the higher education system.

2. Owing to the predominantly application-orientated research carried out at the AdW institutes, the high proportion of industrial joint ventures and a clearly defined requirement for these studies, it is recommended that most of this work be continued under the aegis of the Fraunhofer Society (FhG).

3. The proportion of priority research programs that would fall under the typical responsibilities of major research establishments is considerably smaller. The Science Council recommended that flow research should be continued as part of the German Aerospace Research Institute (DLR), and computer architecture and computer communication as part of the Society for Mathematics and Data Processing (GMD).

4. In the field of applied mathematics, the Science Council recommends founding an institute of applied analysis and stochastics to be funded in accordance with the general research funding agreement on the joint funding of scientific research establishments ("Blue List"). Work in these fields has become an increasingly important basis for the development of advanced technologies. The Science Council considers that an adequate complement for the institute would be at least 50 scientists.

However, according to the Cologne experts, there are a number of teams in the six AdW institutes whose work is incompatible with the criteria for state-funded research and therefore should not be continued.

With these recommendations, the jobs of some 530 scientists seem to be secured, as a new form of institutional funding is recommended for some two-thirds of

the scientists employed in the former institutes. The proviso is that the laender contribute the usual proportion of 50 percent for nonuniversity research establishments. The discussions still have a long way to go.

Solid-State Physics

91MI0281B Bonn WISSENSCHAFT, WIRTSCHAFT, POLITIK in German 27 Mar 91 pp 7-8

[Text] The Institute of Solid-State Physics and Electron Microscopy (IFE) in Halle holds a prominent position among the physics institutes of the former GDR Academy of Sciences. The Science Council therefore proposes that the IFE should be continued as a Max Planck Society institute. However, as some research priority areas overlap with the current topics covered by the Max Planck Institute of Metal Research and Solid-State Research in Stuttgart and by the Fritz Haber Institute in Berlin, an appropriate distribution of tasks will therefore be necessary.

The Science Council welcomes the Fraunhofer Society's plan to set up a team in IFE from its Institute of Material Mechanics in Freiburg.

The Institute of Cosmic Research has "good technical scientific potential." In addition, some teams have produced "noteworthy research contributions." The Science Council considers its future to be in the field of planetary remote sensing, so it recommends founding a German Aerospace Research Institute (DLR) facility for this purpose in Berlin-Adlershof.

A facility for regional remote sensing under the aegis of the DLR, is proposed for the Neustritz site. It would also function as a user data center.

The special session of the Science Council in Mainz also considered the seven institutes of the "Economics and Social Sciences" section of the former GDR Academy of Sciences. At present they have some 530 employees, including 370 scientists. Located in Berlin (East), they are: the Institute of Economic History, the Central Institute of Economics, the Institute of Sociology and Social Policy, the Institute of Scientific Theory, History, and Organization, the Institute of Contemporary Youth Research, the Sociology Information Center, and the Institute of Jurisprudence.

Funding for only 40 percent of the scientists employed in the former institutes, and who will now work in new environments, has been recommended.

The closure of the institutes is recommended because of their considerable internal heterogeneity and the lack of interdisciplinary cooperation.

In the near future a new "Institute of Empirical Economic Research" (economic trend research and structural reporting) could be established. A "Research Commission on Social and Political Change in the New Lands" is also being planned. Qualified scientists will be reintegrated into the universities.

Germany: BMFT Funds Eastern Biotechnology R&D

91MI0284 Graefelfing BIOENGINEERING FORSCHUNG & PRAXIS in German Feb 91 p 6

[Article by Dr. Ekkehard Warmuth of the Federal Ministry of Research and Technology, Bonn: "Biotechnology Funding in the New Federal Laender"]

[Text] In July 1990 scientists in the biology and biotechnology research establishments in the former GDR were asked to write up their opinions as to the direction that future research should take in the form of project profiles for use as reference material by the Federal Minister of Research and Technology (BMFT).

Since then, the BMFT has received some 660 profiles (about 60 percent from the institutes of the Academy of Agricultural Sciences and the former Academy of Sciences (AdW), 20 percent from university establishments, and 20 percent from industry). They will be examined jointly by scientists from eastern and western Germany with the DECHEMA [German Society for Chemical Equipment] technical committees in Frankfurt/Main. Some 250 profiles have been recommended for grants under the BMFT biotechnology program.

In individual cases, project leaders can also recommend applications to other BMFT programs or to the German Research Association (DFG).

To date, 200 biotechnology projects from institutes of the former AdW, universities, and the Academy of Agricultural Sciences have been recommended for BMFT grants for the period from January to December 1991. The funds so far approved amount to some 12 million German marks [DM]. A further 50 projects from industry are expected to follow. Some DM6 million funding has been budgeted for them in 1991.

The priority areas for biotechnology funding in the new laender are in methods and process development. Emphasis is placed on:

- bioprocess and bioreactor engineering (DM1.8 million);
- biocatalysis and enzyme engineering (DM1.7 million);
- and
- cultivation of animal cells (DM1.7 million).

Biological disposal processes (DM1.2 million) and biological safety research projects (DM0.8 million) also account for a large proportion of funding.

The funding measures are intended mainly to overcome the poor conditions for biotechnology research in the region of the former GDR. The means not only material and technical equipment but also the lack of opportunity to travel, acquire information, hold technical discussions, or compete or cooperate with the best partners.

The intention is to encourage integration of the scientific potential of eastern and western Germany as quickly as

possible in order to achieve high-quality biology research and technology throughout Germany.

East Berlin Molecular Biology Institute Prospects Viewed

91MI0285 Graefelfing BIOENGINEERING
FORSCHUNG & PRAXIS in German Feb 91 p 7

[Text] Unlike many other former GDR Academy of Sciences institutes, the Central Institute of Molecular Biology (ZIM) in East Berlin has a good chance of maintaining its place in a new German research structure.

The ZIM announced recently that in addition to its 11 million German mark [DM] budget (second half of 1990), the Federal Research Ministry has approved equipment costing DM857,000 for 10 projects for which [the center] has submitted applications.

According to the GDR Academy Coordination and Liquidation Office (KAI), a molecular biology center having ZIM as its core will be set up at the ZIM site in Berlin-Buch. The funds approved will make it possible to purchase more urgently needed research equipment "than ever before," the institute states in a press release. It will be used in genetic research, in biosensor research, and for immunological work.

Additional funds for other projects have been provided by the Fund for Structural Measures in the Health Sector, the German Cancer Society, and the Federal Trade Ministry. More than 30 applications for funding for future projects have been filed with the Federal Research Ministry.

Even prior to the change of course, the ZIM had been a "showcase institute" of international repute. From an early stage it had worked independently, alongside the central institutes of cancer and cardiovascular research, to earn a position in pan-German science.

The institute's cooperation on a European data base on monoclonal antibodies represents another of its responsibilities. This joint project is reported to have been agreed upon back at the end of last year at a European Center for Research Documentation on Immunoclonones (Cerdic) meeting in France. The German Institute of Medical Documentation and Information (DIMDI) in Cologne is also participating in the project. Furthermore, ZIM and the Biotechnology Research Association (CBF) will jointly prepare a "status seminar" on the status of biosensor research.

CNRS Opens Tokyo Office

91WS0386 Paris LE MONDE in French 5 Jun 91 p 12

[Article by Tokyo correspondent Philippe Pons: "CNRS [National Center for Scientific Research]: Waking Up Under the Rising Sun"; first paragraph is LE MONDE introduction]

[Text] The leading French research organization is settling in Japan. Its goal is to restore the balance of scientific and technical exchanges between the two countries.

The CNRS now has an office in Japan. Mr. Francois Kourilsky, the CNRS general director, just inaugurated the new Tokyo office of the leading French (and European) research organization. The office will be headed by a sociologist, a CNRS researcher, Mr. Jean-Francois Sabouret; it will soon have a staff of five, some of whom will work in Japanese laboratories.

According to the CNRS general director, French research can no longer ignore Japan. "Research as we conceive it must be international," Mr. Kourilsky estimates. He seems aware of the fact that, in the long run, it is equally harmful either to bury one's head in the sand and not consider what is currently happening in Japanese research, or to comfort oneself with diatribes on Japanese "cheating." True, the Japanese do not give anything for nothing. True, they advance their pawns mercilessly whenever they are in a position of strength. But they cannot be ignored either. The Germans, for instance, have understood that. We must therefore, collaborate and at the same time protect ourselves.

The CNRS initiative coincides with an intensification of scientific exchanges between France and Japan, which led to several ministers' visits and the forthcoming signature by the two governments of a major framework agreement on scientific cooperation; it will replace the 1974 agreement which, among other things, contained serious gaps concerning the protection of intellectual property.

"There is already an intense scientific collaboration between Japan and France, but it is off balance," Mr. Kourilsky estimates. "There are more Japanese coming to France than French people in Japan. In addition, the collaborations which have been set up until now are somewhat 'wild' in that they are not taking place in a clearly-defined context: actual cooperation presupposes that discoveries made jointly are protected by agreements signed beforehand."

The signature of such agreements with state-owned research organizations (in particular the Agency for Science and Technology and the Ministry of International Trade and Industry [MITI]) as well as with private firms, was one of the objectives of Mr. Kourilsky's recent visit to Tokyo and Osaka. "Over 80 percent of Japanese research takes place in the private sector; this is why we have signed agreements to protect intellectual and industrial property, in particular with the Mitsubishi and Matsushita groups."

The CNRS, Mr. Kourilsky indicated, collaborates with most French industrial groups and with nearly 2,000 firms.

"As we see it, our presence in Japan—on an entirely independent basis but in full collaboration with the

scientific departments of the French embassy in Tokyo—should pave the way for scientific and industrial collaboration in Japan. The competition is fierce but, precisely for that reason, it is better to organize collaboration, which is both desirable and unavoidable, so as to ensure that it takes place under the best possible conditions.”

“In sectors with a strong industrial impact, it is obvious that we shall act in consultation with our partners in the French private sector with whom we have signed framework agreements.” Symptomatically, the new CNRS office is also located on the premises of the French Chamber of Commerce and Industry in Tokyo, Mr. Kourilsky pointed out.

Three Research Lines

In its approach to Japan, the CNRS considers three main research lines: engineering sciences (artificial intelligence, robotics, automation, electronic components), a field in which the Japanese have already proven themselves; life and health sciences (biochemistry, genetics, cellular biology, experimental therapeutics), a field where they seem to lag behind, especially compared with the United States; and finally human sciences and sociology as well as overall environmental and pollution problems.

“The question is how to develop such research jointly. The Japanese tend to view scientific development only in the light of technical and productive usefulness. Certainly, we can learn from this state of mind, which is found precisely in the sectors where the Japanese have demonstrated their strength (mechanics, data processing, biotechnologies, etc.).”

“On the other hand, Japan needs help in basic research. It seems, therefore, that there are strong potential complementarities.” A new means of communication and information between France and Japan, the CNRS office should contribute to restore the balance of exchanges between the two countries.

Germany: Eastern Science Academy Institutes To Lose Financing

91WS0310C Duesseldorf VDI NACHRICHTEN
in German 29 Mar 91 p 14

[Article by Michael Peter: “No Hope for 7,000 Researchers”]

[Text] VDI-N, Berlin, 29-03-91—The rebuilding of the East German research community is now under great time pressure. The Scientific Council hopes to have evaluated all the institutes of the former Academy of Sciences (AdW) by the middle of this year. Following that, the recommended changes must be undertaken immediately, according to Prof. Dieter Simon, the Chairman of the Scientific Council. Financing of the institutes will only be ensured until the end of the year. In a meeting of the economic and research ministers of

the new States with the Federal Minister of Research Heinz Riesenhuber in Berlin, Prof. Simon expressed his concern that the recommended measures would, because of routine daily minutiae and the sluggishness of the various commissions, get so mutilated as to become unrecognizable. To prevent that from happening, Simon asked that a conversion commission be established. Otherwise, the danger exists that even the institutes which have been evaluated positively might fall by the wayside as well.

Riesenhuber emphasized in Berlin that the chance to restructure the East German Research community exists now. “If we do not succeed now, it will be much more difficult later on,” the Bonn minister stated. In his own ministry, however, it is still very uncertain as to just how much support will be allocated to cover the conversion period, i.e., the phase after the recommendation and the establishment of the new institutes. The planned 400 million German marks for the East German Academy of Sciences for the coming year, Riesenhuber cautions, lie “at the lowest limit, if not actually beneath it.”

Of the 25,000 former Academy institute employees, Riesenhuber estimates that only 7,000-10,000 will remain in research. So as not to nourish false hopes in the employees of the institutes that have been negatively evaluated, Manfred Erhardt, the Berlin Science Senator, asks that those institutes be shut down as soon as possible.

To be sure, the new States will employ some of the former Academy researchers in the various universities. But in the opinion of Hinrich Enderlein, the present Minister of Brandenburg, that alone can not solve the Academy's personnel problem.

German Research Minister Wants Coordinated Human Genome Effort

91WS0310B Duesseldorf VDI NACHRICHTEN
in German 29 Mar 91 p 1

[Article: “German Research Minister Wants to Harmonize Genome Analysis”]

[Text] VDI-N, Bonn, 29/03/91—The Federal Ministry for Research and Technology (BMFT) wants the EC Commission to achieve a unified stance in genome research activities. Two studies of the European Science Foundation (ESF) and the Academia Europaea, published last week, support this view of striving to harmonize research in human germ plasm throughout Europe.

“The benefits derived from genome research lie first in pure fundamental research, in the advance of scientific knowledge, but in medicine as well,” the Minister of Research Dr. Heinz Riesenhuber said in Bonn, emphasizing the importance of genome research.

Both studies conclude that the tempo in genome analysis today is set by the United States, where efforts are greatest to maintain continuous increments in the

amounts of research grants. BMFT data indicates that, despite significantly less resources, the European contribution in this field—measured by the number of scientific publications—amounts to more than half of the total of U.S. papers.

The most recent research results even indicate that Europe is progressing more rapidly than the United States. "But this trend could hardly continue if Europe fails to reconsider its approach, because the amount of resources expended in Europe for genome research amounts to only about one-third the amount spent in the United States," Riesenhuber warned. While about 50 million dollars [U.S.] are presently being spent in Europe on this research per year, 150 million dollars are being expended in the United States for the same purpose.

Germany: Superconductors Receive Key Technology Status

91WS0310A Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 12 Mar 91 p 17

[Article: "Superconductors as the New Key Technology"]

[Text] Federal Minister for Research and Technology Riesenhuber reported last Monday that savings in power and material are emerging ever more clearly through progress in the development of superconductivity as a method of transmitting power without electrical resistance. Applications advantages have already been found in medical technology, high-frequency technology, power engineering, electronics, and sensors. Riesenhuber, however, does not expect the great breakthrough of superconductance as the new key technology in electrical engineering for another 10 to 15 years.

Riesenhuber is convinced that the German economy and German science is fully armed in research and development for superconductivity. Even though research expenditures are comparatively small in Germany, its research competes well internationally. The Federal Republic has already had outstanding achievements in superconductance. Proceeding from the philosophy that economies must be made wherever possible, Riesenhuber expects the private sector to make even greater financial contributions in the further development of superconductance. For long-term projects, however, even the larger corporations can still count on Government aid. Riesenhuber personally prefers supporting research and development projects that are characterized by close cooperation between the scientific community and the economy. 390 million German marks have been set aside in the budget under the rubric "Superconductance Grant Program" for such joint projects. Several projects have already been approved for researchers in the new German states.

Philips Rejects EC Microelectronics Merger Plan

91WS0335A Paris LE MONDE in French 4 May 91 p 22

[Article by Christian Chartier: "Philips Cool to Creation of Single European Integrated Circuits Company"]

[Text] Eindhoven—Announcing on Wednesday 1 May what were described as the "encouraging" first quarter earnings posted by Philips, Mr. Henk Appelo, a member of the Dutch multinational's board of directors, voiced the Eindhoven-based group's categorical opposition to proposed European measures to rescue the electronic components industry. Neither the European Commission's voluntarism nor imposition of tariff protection will keep the foundering industry afloat, according to Mr. Appelo. The only way to save it is through "better cooperation" between manufacturers in the EEC.

"Too early," "futile," and "unnecessary" were the terms Mr. Appelo used to disparage the idea that a European semiconductor company could or should emerge from a regrouping of the specialized divisions of multinational Philips, Franco-Italian SGS-Thomson and Germany's Siemens.

Mr. Appelo deliberately downplayed the importance of the Brussels commission's ideas on this subject. Mr. Jacques Delors, the commission's president, met recently with the heads of the five big European electronics groups, but "it was he who chose the invitees"—meaning Philips was not the petitioner?—"and he who drew his own conclusions."

Concerted Strategies

In other words, Philips "is not thinking about a merger" of its components activities with those of SGS-Thomson and Siemens. Also, Mr. Appelo made no reference to the most recent meeting of European industry ministers (see LE MONDE of 30 April) or to their decision at that meeting to task a group of experts to identify what measures are needed to rescue the European electronics industry.

Philips believes it is artificial and premature to consider unifying the integrated circuit industry as a means of achieving that end, and Mr. Appelo cited the failure of the Unidata project—an effort at joint development of European computers between 1973 and 1975—as a case in point. Mr. Appelo said "strengthened coordination in research programs and intensification of technology exchanges" in the components field were sufficient, at least for now. He did not say whether Philips deemed such efforts necessary, but he posed the question "whether the JESSI [Joint European Submicron Silicon Initiative] program should not be redefined and focused more tightly."

Philips thus thinks that European manufacturers before all else should "come to a meeting of the minds" and coordinate their strategies, rather than rushing into creation of a product substitution regime.

The Dutch group is also cool to customs barriers. "We are not among those who want to build tariff walls," said Mr. Appelo, referring to the recent appeal by Mr. Alain Gomez for the EEC to increase duties on Japanese components for the next five years. Neither is Philips

advocating a "do-nothing" policy, he added, in apparent satisfaction with the status quo.

Dutch Government Subsidizes Information Technology

91AN0339 Amsterdam *COMPUTABLE* in Dutch
15 Mar 91 p 2

[Article by *COMPUTABLE* correspondent: "59 Million Guilders Available For IT Stimulation—Emphasis on Knowledge Transfer"]

[Text] The Hague—Minister Dr. J. Andriessen of Economic Affairs has made 59.1 million guilders available for the stimulation of information technology. The emphasis this year will be on knowledge transfer, the strengthening of the scientific infrastructure, and the dissemination of information.

There are 124 million guilders available in the Program for Company-Oriented Technology Stimulation (PBTS), including 24 million for the stimulation of information technology. Under the PBTS, firms can submit proposals for feasibility, research, and demonstration projects according to a so-called tendering system. For projects in the field of information technology, the period for applications runs from 3 June to 31 July of this year.

Submitted proposals will be classified by external experts on the basis of quality, originality, and the way in which they contribute to the aims of the technology program. Projects will be awarded subsidies according to this classification until the amount of money available runs out. Additionally, there is a further 35.1 million guilders available for projects conducted within the scope of the National Technology Program for Information Technology.

In addition to information technology, a total of 75 million guilders is available for materials technology, biotechnology, and environmental technology. This amount, together with the 124 million guilders already referred to for the PBTS, brings the total budget available for the four national technology programs to approximately 200 million guilders.

Last year, about 700 project proposals were submitted to the PBTS by various companies. That was 8 percent more than in 1989. Fifty-five percent came from companies with fewer than 200 employees, and one in five of the projects involved cooperation with another firm or research institute. The independent boards of experts established a general improvement in quality over 1989. In the area of information technology, 153 project proposals were accepted last year, as opposed to 154 the year before.

Netherlands: Government To Boost Industry Incentive Program

91AN0317 Rijswijk *POLYTECHNISCH WEEKBLAD*
in Dutch 28 Feb 91 p 1

[Article by Benne Holwerda: "Ministry of Economic Affairs Provides Support to Companies That Introduce Microelectronics"]

[Excerpt] Small and medium-sized businesses in the Netherlands are lagging behind with regard to the application of modern microelectronics to their products. The Ministry of Economic Affairs would like this situation to change. This week, the "Incentive Program for the Application of Microelectronics," abbreviated MiToe, was presented. Financial support and specific advice are to lure companies that are not electronics-minded.

Through this new program, the Ministry of Economic Affairs seeks to increase the added value of Dutch-made products. The MiToe program is part of the Ministry's "Action Plan for Microelectronics in the Netherlands." This action plan was launched exactly a year ago in response to a report by the Central Institute for Industrial Development which showed that Dutch companies were lagging behind their competitors in Germany, France, and Japan as far as the application of modern electronics is concerned. Through the action plan, the Ministry seeks, over a period of four years, to reach 10 percent of the companies that are unfamiliar with microelectronics and provide them support in taking their first steps in the area.

Money and Advice

The electronics sector is very pleased with the program. For some time, subcontractors have expressed their concern about their small customer base, claiming that they are too dependent on a limited number of large companies. They would like to see an increase in the "autocreative capacity" of Dutch industry. Microelectronics is one way of achieving this.

The MiToe program will last for four years with an overall budget of 22 million guilders. The program is being coordinated by the Product Center of the Netherlands Organization for Applied Scientific Research (TNO). Along with financial support, the participating companies will also be given tailor-made advice. MiToe will consist of three phases, explains Dr. M. Stuijvinga, acting program director of MiToe. In the selection phase, a visit is made to the company (free of charge) and the possibilities of upgrading the product range by introducing electronics are investigated. Stuijvinga expects that approximately one-half of the companies visited will qualify for further action. The next phase involves a more extensive introduction survey whereby members of the MiToe project team and the company look into possible [electronics] applications and market opportunities. Half of the external costs for the introduction survey—with a ceiling of 20,000 guilders—are covered by MiToe. Finally, in the third phase, an introduction

plan is established which primarily involves product development, marketing, personnel, and production planning. The costs for this phase amount to maximum 150,000 guilders, the maximum MiToe contribution being 60,000 guilders. Moreover, only external costs are reimbursable. [passage omitted]

CORPORATE ALLIANCES

EC Commission Authorizes Alcatel/Telettra Merger

91AN0407 Brussels EUROPE in English 13 Apr 91 p 9

[Article: "EEC/Competition: The European Commission Authorises the Alcatel/Telettra (Telecommunications) Merger Having Obtained Firm Guarantees Concerning Freedom of Competition on the Spanish Market"]

[Text] Brussels (Agence Europe)—Pursuant to the EEC ruling on the prior monitoring of mergers of European dimension, the European Commission adopted a decision for the first time further to a full enquiry (but without using all the time limits available to it in these cases). Authorisation is for merger between the French group Alcatel and the Italian group Telettra (FIAT subsidiary) in the telecommunications field. Alcatel, which is held at 61.5 percent by CGE (General Electricity Company) France, is buying from Fiat 69.2 percent of the Telettra capital (Fiat remaining holder of 25.4 percent in Telettra). At the same time, Magneti Marelli from the Fiat group is buying 50.1 percent of CEAC, subsidiary to CGE in the electric accumulator sector—this second part of FIAT-CGE agreements is still being studied by the Commission.

The Commission noted that the group resulting from the Alcatel/Telettra merger will hold some 80 percent of the Spanish telecommunications equipment market. This is why it opened the enquiry after having received notification of the operation. During the enquiry—for which firms fully cooperated, stressed the spokesman—the Commission obtained formal guarantees on the fact that free competition will be introduced on the Spanish market, thanks to the following measures:

a) The Spanish purchaser of telecommunications equipment, Telefonica, currently holds shares in the Spanish subsidiary of Alcatel (20 percent), in the Spanish subsidiary of Telettra (10 percent) and in Telettra Internationale (5.4 percent). Alcatel has undertaken to buy these different shares, so that there is no longer any connection between the buyer and the sellers of equipment (links which would have given these sellers a privileged access to the Spanish market);

b) Telefonica has given assurances concerning its intention to diversify its suppliers and to open its purchases to free competition of not only the firms already established in Spain (like Ericsson), but also of those which are not established there (like Siemens, for the moment).

Procedures will be transparent as well as technical specifications. The Spanish market will thus open up to competition.

Sir Leon Brittan [EC Commissioner for competition] personally welcomed the successful outcome of this affair, and emphasised that normally a merger resulting in a group holding 80 percent of a market would not be acceptable but that the assurances and the commitments obtained have enabled him to approve it.

European Space Agency, Romania Discuss Cooperation

91WS0285C Paris AFP SCIENCE in French 21 Mar 91 p 17

[Article: "Initial Contact Between ESA and Romania"]

[Text] Paris—The European Space Agency (ESA) and Romania made initial contact last week during the Paris visit of a Romanian delegation headed by Prof. Stephan Ispas, rector of the Technical Academy of Bucharest, who was received by Mr. Jean Arets, chief of international affairs, in the absence of Mr. Jean-Marie Luton, the agency's director-general.

During the meeting, in which the heads of ESA's major offices participated, mention was made of prospects for cooperation between ESA and Romania in the fields of space science, remote detection, microgravity, and telecommunications. The Romanian delegation invited ESA to send a delegation to Romania to visit the various organizations and institutions involved in aerospace activities.

Like other former East-bloc countries, Romania would eventually like to be among potential candidates for entry into the agency should ESA open its council to other countries. From 24 to 26 April, Bucharest is hosting the Satelcomm-91 exposition, organized jointly by the European Radio Broadcasting Union (UER), the European Telecommunications Satellite Organization (EUTELSAT), and ESA.

Open Document Architecture Consortium Created

91AN0408 Brussels EUROPE in English 19 Apr 91 p 17

[Text] Six data processing companies have created in Brussels a European consortium of economic interest named Open Document Architecture Consortium. The founder members are: Bull SA (Paris), Digital Equipment International BV (Nijmegen, Netherlands), IBM Deutschland GmbH (Stuttgart), ICL—International Computers Ltd (London), Siemens Nixdorf Information Services NV (Brussels), and Unysis Belgium SA (Brussels). According to their statutes, the consortium is charged with subsidising the development and marketing of Toolkit which will facilitate the development of products using the Open Document Architecture. It will be able to concede licenses relating to it, allowing the consortium to finance itself.

Five Biotech Companies Form Joint Venture

91AN0380 Rijswijk BIOTECHNOLOGIE IN
NEDERLAND in Dutch Apr 91 p 37

[Article by Joost Melten: "Five European Suppliers Join Forces"]

[Text] Five small suppliers of biotech instrumentation and reagents have decided to tackle the European market together. They are Biocell Consulting (Greilingen, Switzerland), Biotech Instruments Ltd (Luton, UK), Dalton bv (Waalwijk, the Netherlands), and Dunn Labortechnik GmbH (Asbach, Germany). The companies—which are not competitors from a geographical point of view—will form a joint venture called Combio Group of Companies, but will remain independent. They plan to market each other's products in their own territory. They will share their technological and market knowledge to be in a better position to face competition in Europe after 1992. This will allow each of the companies to maintain its flexibility and it will offer the advantages of a larger, supportive organization. The participants' ultimate goal is to form a "European Economic Joint Venture," a kind of European company. The number of participants will not increase during the first 2 years. The Combio Group will employ 50 people and, for the time being, it will remain a small company among multinational suppliers and manufacturers of instrumentation.

Thomson-CSF, British Aerospace End Joint Missile Project

91WS0285A Paris LE MONDE in French 16 Mar 91 p 25

[Article: "Thomson-CSF and British Aerospace Stop Their Joint Missile Project"; first paragraph is LE MONDE introduction]

[Text] On Thursday, 14 March, Thomson-CSF and British Aerospace announced their decision to postpone talks on merging their guided missile activities "by mutual agreement" (see our late editions, 15 March). They did, however, confirm their intention to pursue possibilities of cooperating "on new programs and new technologies."

The Gulf crisis and East-West detente appear to have got the better of a major cooperative venture between two European arms manufacturers. "Between the drop in demand on Western markets and the uncertainty coefficient of markets elsewhere in the world, the environment is much too uncertain," Thomson CEO Alain Gomez commented.

Initiated in 1988, discussions between Thomson-CSF and British Aerospace concerned the creation of a joint venture, Eurodynamics, which would have merged common activities in the area of guided missile systems. This project was approved by the British commission on monopolies and mergers on 30 January. The resulting company would have had revenues of almost 15 billion francs and employed 15,000 workers. However,

Thomson and British Aerospace did confirm their direct cooperation on the Active Sky Flash missile, as well as "the preservation of existing links in the area of the multilateral Trigat and FAMS projects."

Thomson also announced the acquisition of a 50-percent interest in Britain's Pilkington Optronics. This operation strengthens its position on the European optronic equipment market. Optronic equipment is used in detection, fire control, and missile guidance systems.

Finland/UK: Major Cellular Telephone Company Created

91AN0298 Chichester INTERNATIONAL
TELECOMMUNICATIONS INTELLIGENCE
in English 25 Feb 91 p 22

[Text] An offer by Nokia of Finland to acquire Technophone Limited, a UK-based cellular telephone manufacturer, for a total consideration of 34 million pounds in cash, has been accepted by Technophone shareholders. The transaction is expected to be completed in March.

The deal will bring together Europe's leading manufacturers of cellular mobile phones and will strengthen the competitive position of the two companies in the global market place. The merger will create the second largest cellular phone manufacturer in the world, behind Motorola.

Technophone, based in Camberley, Surrey manufactures telephones that comply with "almost all of the world's cellular standards" and has currently supplied mobile and portable phones to over 30 countries. It has production facilities in the UK and Hong Kong and its financial year ended March 31st, 1990, posted net profit of 2.5 million pounds on turnover of 49.1 million pounds. Mr. Nils Martensson, who established Technophone in 1984, will continue as the company's President. The company has 750 employees.

Nokia Mobile Phones, based in Finland, employs 3,500 people and has manufacturing facilities in Finland, Germany and South Korea. In 1990 it had a turnover of 330 million pounds.

Peugeot-Renault Research Cooperation Threatened

91WS0382 Paris LE MONDE in French 30 May 91 p 29

[Article by Annie Kahn: "Peugeot Might Question Its Research Agreements With Renault"]

[Text] The PSA group (Peugeot and Citroen) is worried by Renault's alliances with foreign partners, especially Volvo; in particular, they are concerned about the future of their cooperation on research. Until now, competition between the two French manufacturers did not prevent them from carrying out research jointly. These cooperation agreements—which the firms found desirable in

order to lighten their R&D investments, and which were supported by the government—"may well be thrown back into question," people at PSA are warning.

Renault's alliance with Volvo makes the Swedish manufacturer "co-owner of the company's assets," Renault officials maintain. "It is out of the question that Volvo should gain automatic and free access to the research programs in which PSA has invested," Mr. Jean-Yves Helmer, manager of the PSA automobile division, worries. That position was strengthened after the Japanese Mitsubishi acquired an interest in Volvo's Dutch subsidiary.

In addition to their joint participation in community research programs (Drive program) or in EUREKA programs (Prometheus program), the two firms created a GIE [economic interest group] 10 years ago in order to pool their research efforts in certain fields. Three projects were launched by the GIE: one on the clean engine and another on multiplexing; the third one, on safety, had actually not really started yet, as its content was challenged by the government, which was to provide 35 percent of the financing (requiring an overall budget of 1.25 billion French francs).

But since the GIE had a 10-year life span, it was expected to be extended after 1 January 1991. Until now, this has not been done. "Let's renew it for one year, to see what we can or cannot do together," people at Renault are proposing.

Although the two groups seem to agree to complete the work started before the Renault-Volvo agreement was signed (clean-engine project), their positions on subsequent projects differs; PSA wishes to adopt a "more reserved" attitude.

France's SAF Buys Swiss Welding Firm

91WS0285B Paris LE MONDE in French 15 Mar 91 p 30

[Article: "SAF (Air Liquide Group) Becomes No. 2 European Welding Company"]

[Text] Soudure Autogene Francaise (SAF), a subsidiary of the Air Liquide group, has just bought the welding division of the Swiss firm Oerlikon-Buehrle. The purchase price was not made public. The division, which has revenues of approximately 1.6 billion francs [Fr], complements SAF's activities and will double its size, making it Europe's No. 2 welding company. It particularly strengthens SAF's position in Germany. The operation will bring the Air Liquide group's welding industry earnings in Europe, Asia, and North America to around Fr5 billion. Material and products in this industry are undergoing considerable technological change.

Thomson-CSF, GEC-Marconi To Collaborate on Radar R&D

91WS0383B Paris LE MONDE in French 31 May 91 p 30

[Text] Thomson-CSF and the British group GEC-Marconi have decided to work together on developing the new

generation of advanced radars. On Wednesday 29 May, the two European defense electronics specialists announced the creation of a European consortium to design and market the "active antennae" that will equip the measurement and detection devices of combat planes 20 years from now. The reasons given for this collaboration are the fantastic costs required to design and develop the military radar of the year 2000. The two electronics manufacturers are talking about a heavy investment program involving five billion French francs [Fr].

The capital of the new company, christened GEC Thomson Airborne Radar, should be divided equally between the British and French firms. This trans-Channel association of Europe's two great airborne radar designers is the outcome of preliminary talks that were initiated about two years ago. It was strongly encouraged by the two countries' defense ministries. Mr. Jean-Robert Martin, director of Thomson-CSF's aeronautics branch, reckoned Thursday that London's support of the plan makes it unlikely that the case will be submitted to the British monopolies commission.

The agreement between Thomson-CSF and GEC-Marconi comes two months after the failure of Eurodynamics, another Franco-British project that was to have brought together the group directed by Mr. Alain Gomez and British Aerospace on guided missile research. Thomson-CSF and GEC-Marconi are currently competitors on the two most advanced European radar programs.

Germany: Carl Zeiss Jena To Become Fujitsu ASIC Design Center

91AN0416 Paris ELECTRONIQUE INTERNATIONALE
HEBDO in French 9 May 91 p 9

[Article signed E.F.: "Jenoptik Becomes Fujitsu Design Center"]

[Text] Based on an agreement with a company from the former GDR, the Japanese group Fujitsu gains access to the still emerging East European application-specific integrated circuits (ASIC) markets.

Jenoptik Carl Zeiss Jena, the company from the former GDR, must be relieved. Thanks to an agreement with Fujitsu, the German company becomes the Japanese group's design center for ASICs and, at the same time, eliminates its legitimate fear of not surviving. The agreement, signed with the German Fujitsu Mikroelektronik subsidiary, is the result of an East German and East European market survey. These studies, performed by the Dresden-based microelectronics center, predict that ASIC requirements in the former GDR will rise from 500,000 circuits in 1990 to 3 million in 1993, and to over 4 million in 1996.

Know-How in ASIC Manufacturing Equipment

In cooperation with Jenoptik, Fujitsu organized a presentation of ASIC products and their versatility in Jena early February. Encouraged by the record attendance at

the meeting, the manufacturer decided to organize training sessions on the subject. The sessions could start very soon thanks to Jenoptik's team of ASIC specialists.

Indeed, ASICs are not really new to Jenoptik. ASIC design at Carl Zeiss, as the company was then called, started in 1986 under Dr. Fred Grunert and it has continually been developing ever since. ASIC expertise became indispensable for enhancing the equipment of the GDR company in terms of functional performance and miniaturization. The top of its range was its 1.5-micron complementary metal oxide semiconductor (CMOS) technology ASICs, integrating up to almost 4,000 ports.

From now on, to quote Dr. Grunert, "access to Western technology will allow Jenoptik to avoid having to reinvent the wheel, as was the case in the past." In the new partnership with Fujitsu, Jenoptik will contribute a quite significant amount of know-how in semiconductor manufacturing equipment, in exchange for expertise in chips from the Japanese manufacturer, which makes its ASIC technologies available to potential clients. Close cooperation with the University of Chemnitz, in particular in software development, and its traditionally relationship with East European countries increase Jenoptik's contribution. Carl Zeiss Jena has indeed had foreign trading rights since 1965 and has produced for the "free market," a factor that has certainly contributed to Fujitsu's attention since the opening of the borders.

Plans for Mitsubishi, Daimler-Benz Cooperation Reviewed

October Meeting Planned

91WS0359A Munich *INDUSTRIEMAGAZIN*
in German May 91 pp 22-32

[Article by Anton Hunger: "Star of the Samurai: the Mitsubishi-Daimler-Benz Alliance"]

[Text] Even in the face of wild speculation following the failed Venice summit, the planned alliance between Mitsubishi and Daimler-Benz is taking shape despite all the accompanying skeptical music.

Shinroku Morohashi appeared to be in good spirits: "I am not speaking German this morning," the president of the Mitsubishi Corporation informed his guest from Stuttgart and somehow gave the impression that he otherwise would normally be using the foreign language with German visitors.

This frank admission of the erstwhile anglophile Japanese gentleman, who in the morning meeting with the financial head of Daimler-Benz, Dr. Gerhard Liener, served as his own interpreter, was not simply idle talk. At the evening dinner at the Kinsui Restaurant, he literally played all the registers of his German language capability—however modest they were.

The mightiest of the Mitsubishi samurais had ardently rendered German folk songs ("Sah ein Knab; ein Roeslein stehn"), had reflectively recited from Ludwig Uhland ("Es stand in alten Zeiten ein Schloss so hoch and hehr"), and, facing Leiner, jokingly recited, as though pulling the petals from a daisy: "I love you, I love you not." And then he ended the symbolic petal pulling demonstratively with "I love you."

That which was already becoming apparent in the discussions of the morning of 12 March 1991 at Mitsubishi headquarters (where Morohashi had said: "We now want to accelerate our joint enterprise."), was confirmed that evening. The ice had finally been broken, the temporary dissonances were heard no more.

Just a week before Liner's most recent Tokyo trip, on 7 March, the International Herald Tribune had asked the question: "Have Daimler-Benz and Mitsubishi gotten a divorce?" In its conjecture the respected newspaper referred to the summit meeting of the heads of the two concerns, which was to be held in Venice on 21-22 April, but which never took place. Poking fun, the newspaper wrote: "Too much premature importance was given to the German-Japanese attempts at cooperation."

But the renowned newspaper was wrong. The April summit was not canceled, it was just postponed. Morohashi and his entourage want to get together in summit talks with Daimler-Benz boss Edzard Reuter and his team in a hotel near Stuttgart in the second week of October against the background of the recent Gulf War.

At that time they will talk turkey. Meanwhile, the various groups have come to so many agreements that a series of very spectacular projects can be expected to be approved at the next super-meeting in Stuttgart:

- Joint procurement of materials in the world markets ("Global Sourcing"); increased purchasing by the Daimler concern in Mitsubishi companies and their suppliers;
- Assembly of Mitsubishi's small car "Canter" (the two-tonner) in a Mercedes plant in the former GDR (probably in a new plant);
- Development and construction of a joint cross-country vehicle, including common assembly and body parts deliveries;
- Cooperation in the solution of automobile-related environmental problems;
- Production of integrated circuits (bipolar semiconductors for use in electronic entertainment products) for the Mitsubishi Electric Corporation (Meko) in the Heilbronn Plant of the AEG-Affiliate TEG Telefunken Electronic GmbH (subcontract); licensing Melco high-performance chips to the AEG;
- Participation of Mitsubishi Heavy Industries (MHI) in the civilian power plant projects of MTU, an affiliate of Deutsche Aerospace, and its U.S. partner

Pratt & Whitney (including possible equity participation);

- Cooperation between Daimler's service affiliate "debis" and the Mitsubishi Corporation in the fields of management information systems and offsetting transactions.

It apparently seems that the mega-deal that the company representatives Edzard Reuter and Shinroku Morohashi had initiated at their first meeting in Paris in November 1989 is underway. And if recent indications do not deceive, then the drawing together of Daimler-Benz and Mitsubishi could still become an economic and business sensation of the highest order—with repercussions in totally new areas of business, effects on the procurement and production structures of both parties, as well as foreign trade and political changes resulting from the establishment of Mitsubishi in Europe and Daimler-Benz in Japan (see interview below).

Some things will also change in the structures of the Mitsubishi group. Never before had a non-Japanese company effected a common undertaking with an entire Japanese conglomerate. To date, only the individual companies of the Group (Keiretsu) maintained business relations with the others. The fact that today the executive vice president of the Mitsubishi Corporation, Takeshi Eguchi, in his function as liaison officer for Morohashi's quite independent colleagues Toyoo Tate (Mitsubishi Motors), Yotaro Iida (Mitsubishi Heavy Industries), and Moriya Shiki (Mitsubishi Electric) can act as spokesman in the Daimler negotiations, is something entirely new in Japan's post-war history.

Actually, the international newspapers treated the first summit meeting between the Mitsubishi and Daimler top men in Singapore on the third and fourth of March 1990 like an economic earthquake: "The event hit the world economy like a shock wave," wrote the Japanese Mainichi Shimbun, for example. And apparently upset by the imminent prospect of a near fatal wound from the largest German company (turnover 86 billion German marks [DM]) combined with the largest Japanese (roughly a DM700 billion turnover), the French *Le Monde* detected a "dangerous revival of the German-Japanese axis." And, finally, the *Financial Times* explained the Singapore meeting as affecting "nothing less than the worldwide future of the automobile, aviation and space, and electronic industries."

These fears, evoked internationally, caught the Japanese rather unprepared. The shock was such that they originally thought that their good business relations with their most important partner, the United States, had been put at risk.

The Nippon strategists then coyly played the planned cooperation with Germany's model company down: "Agreement aside, we want," Morohashi explained in April in the Mainichi Shimbun, "to remain friends, absolutely nothing has been decided." And MHI president Yotaro Iida present Daimler-Benz to the whole

world as a downright supplicant: "Daimler asked us whether we could cooperate in something. And you simply cannot respond with a simple no."

Morohashi & Co. still want to downplay the matter (see interview below). But after the October meeting in Stuttgart, at the latest, all the skeptics will soberly understand that the flirting with Daimler has only begun.

Because the various projects that are on the agenda at the next summit are only a part of the planned alliance between Germany's number one and the Mitsubishi Group, which is almost ten times as large. The joint study groups of the two companies are constantly discovering new possibilities (e.g., aircraft leasing, or the construction of the "debis" main administration building on Potsdam Square in Berlin, with Mitsubishi as the main contractor) and are making feasibility studies.

At any rate, the top managers of the two companies will no longer be concerned with two projects at the Stuttgart meeting, because they have already been signed and sealed in the meantime. Thus, marketing cooperation between Mercedes-Benz AG and Mitsubishi Motors Corp. (MMC) began early in the year. The cooperative venture Stuttgart Auto Service Inc. wants in 1991 to reorganize 20 Japanese Mitsubishi Gallant dealers into so-called Dual-Dealers, which, after the personnel have been retrained, a spare parts warehouse established, and the Mercedes model supplied, will market Swabia's noble vehicle. On 10 March 1991 in the presence of Mercedes executives Juergen Hubbert and Eberhard Herzog, the first Dual-Dealer, the Chiba Mitsubishi Motor Sales Col., Ltd., in Narita, was sent on the Mercedes trip by MMC boss Toyoo Tate. By 1994 the number of these dealers is to increase to over a 100; together with the sales locations of Yanase General Importers and its own Star-Dealers, Mercedes would have about 280 dealers in Japan.

Much more spectacular is the second project however, which likewise has been concluded in the interim, namely, the development of a complete telephone network.

After the Swabians had failed in their first approach for a D2 radio telephone net license in December 1989, they now want to cover the former GDR with telephone networks. To this end, Liener founded the project company "Telenetz plus," to which, besides Daimler-Benz (50 percent), the Deutsche Bank (10 percent), and the U.S. Nynex Telecom Firm, the Mitsubishi Corporation and Nippon Telephone & Telegraph (20 percent) also belong.

The consortium has in the meantime applied at the Deutsche Bundespost Telekom and, in the opinion of the post office experts, it has a good chance of winning the bid in the near future for two projects each involving 25,000 telephone connections (size of orders DM25 million).

Since within the Daimler company Deutsche Aerospace (Dasa) is responsible for telecommunications, following earlier work by Liener in February 1991, the head of satellite communications at Dasa affiliate Messerschmitt-Boelkow-Blohm (MBB), Dr. Peter Zimmermann, was appointed the head manager for telephone affairs in the new Federal States.

If the consortium gets the contract, then for the first time Japanese and U.S. suppliers would have a foot in a country with its own national telephone manufacturers (Siemens and SEL) with a post office contract. Telephone markets worldwide have always been considered shut off. No government in the world has ever permitted foreign suppliers to interfere with the monopolistic position of national purveyors of the particular postal authorities.

And yet the newcomers are still not content with this sensational breakthrough into new domains. If the EC permits the private operation of telephone networks in a few years, the consortium will also want to be the operator and profit from it.

Admittedly the Japanese will not be the only ones to profit from the project in the former GDR. Mitsubishi and Nippon Telephone & Telegraph (NTT), as terms for being in the consortium, had to agree to consider their "Telenetz plus" partners should an analogous situation occur in Japan. Among the associates of Liener, who like his Mitsubishi colleague Eguchi acts as Daimler's liaison officer in the negotiations, it is no longer considered quite so objectionable that Daimler-Benz companies in the future would be just one of several parties involved with the German Siemens and SEL office-building companies in telephone projects in Japan.

If the telephone project in the new Federal States appears presently to be the most spectacular undertaking with Mitsubishi, then the global-sourcing activities can be expected in the mid-term to expand to become the most important cooperative project.

In a Daimler-Benz study "Purchasing Potential Development," the McKinsey Consulting Company established that Mercedes-Benz only obtains 11 percent of its supplies from abroad, AEG 22percent, and Dasa 33 percent. The strongest foreign procurement market is France (1989: DM1.3 billion) ahead of the United States (DM1.2 billion), and Great Britain (DM1 billion).

And the Japanese suppliers, who are renowned for both their quality and price-worthiness, occupy the ninth position with DM285 million.

In order to minimize the generally escalating production costs, the Daimler executive board decided to increase the foreign procurement sources from the present 17percent to at least 20percent. Mercedes-Benz (presently 11percent) has to make the greatest effort in this regard.

In the Munich Global Sourcing Meeting of 26 to 28 February 1991, the Daimler-Benz delegates, headed by Dr. Karl Engelhardt, and Mitsubishi, headed by Kunitake Fushimi from the corporation's Stuttgart Office, agreed rapidly on some specific results.

In future, under the condition that the delivery price—given equal quality for the particular part—is at least 5 percent below the domestic price, the following will occur:

- Mercedes-Benz AG front and rear axles for light trucks, transporter steering assemblies, sintered parts like oil-pump gear wheels, transmission synchronizers, camshaft gears, aluminum wheels, inside and outside mirrors, and cable sets,
- AEG roller compressors, semiconductors, component and component systems for the race and ball bearing and needle-roller bearings, and
- Dasa special turbine disks as raw parts, blades as finished parts, cast parts as well as the electronic components of recreational electronics and aircraft communications

will be obtained from or through Mitsubishi.

The delegates agreed at the same time that Mitsubishi's 160 procurement offices, concentrated in Asia, will also be available to Daimler companies, which now have only seven such facilities.

In another meeting of the participating concerns, held in Konstanz on 1-2 March 1991, Liener and Eguchi approved the decisions that had been arrived at. On 10-13 March Daimler liaison officer Liener discussed these matters with the presidents of the four Mitsubishi companies involved in the alliance: Morohashi, Iida, Tate and Shiki.

Despite the great progress in the agreement on common undertakings, the conversion nonetheless will require considerable time. Thus, for example, the quite laborious process of forming a consensus among the Japanese will take its toll. Since Mitsubishi is not a holding company and legally should not even present itself as a "Group," the presidents of the 29 most important Mitsubishi companies only meet on each first Friday of the month in the so-called Friday-Committee (Kinyokai) for informal talks. For each project that involves several companies, the individual Mitsubishi companies must each be consulted. This is to say that whatever the two liaison officers Liener and Eguchi agree upon, can only be considered approved after the individual presidents have consented. Nor can they, in turn, ignore their respective boards in making decisions. From his experiences, Liener advises: "Whoever is not patient in dealing with the Japanese, ought not even bother to try."

To simplify the process of coming to an understanding, Daimler could naturally eliminate the group negotiations and just negotiate with each Mitsubishi company separately. But Reuter would rather not do that because

the balance, resulting from the give and take, can only be reached in the totality: "The cooperation," the Daimler boss told *Industriemagazin*, "will result in a broad alliance between the four Mitsubishi companies and our house—from time to time favoring one or another of the parties—but all in all on a balanced basis."

Consequently, the summit meetings as well as the installation of liaison officers, which was not an easy problem for Mitsubishi to resolve, were decisively implemented later to the surprise of the men from Stuttgart.

Thus, after the Singapore meeting, Eguchi's predecessor, Yoshio Taniguchio (who has since retired), established a Daimler-Benz Project Department in Tokyo. Its own office, its own business cards, its own logo, and some 20 highly qualified employees demonstrate that the Japanese take the alliance questions with the Germans very seriously indeed.

The counterpart of this department at Daimler's is the so-called KOM-Section (Coordination Mitsubishi), which is headed by Liener and likewise has 20 members. Daimler, however, has not yet established an independent office with the appropriate image for it.

The seriousness of the Japanese may also be inferred from the fact that the Mitsubishi Corporation has set up an office for the newly founded Mitsubishi International GmbH, whose director is Kunitake Fushimi, on the Zettachring in Stuttgart-Moeringen, in the immediate vicinity of Daimler's main administration building. And Mitsubishi Heavy Industries, Dasa's partner, has obtained offices in Munich on the Thomas Wimmer Ring. The director is Seibi Uehara.

Yet the reason for the tremendous amount of time involved in this common undertaking does not entirely result from the awkward Japanese opinion-forming structures. The release procedures for a Mercedes supplier takes, as a rule, between two and four years. Another example is that the exacting quality controllers at Mercedes require the same amount of time to approve parts for the production of trucks and autos.

Much time will also be needed before Dasa can put specific projects on the launch pad with Mitsubishi Heavy. To realize the planned supersonic project (a successor to the Concorde with two and a half times the speed of sound) or the hypersonic project (with six times the speed of sound), Dasa managers, because of the nature of the projects, plan in terms of decades not years.

At the present time, the Europeans (Dasa, British Aerospace, Aerospatiale) and the United States (Boeing, McDonnell Douglas) are in the study phase for the supersonic, in which primarily two essential points await clarification: 1) how can the supersonic blast be reduced so that the Concorde successor can fly over land areas, and 2) how can the fuel be composed so that the emissions beyond the atmosphere are ecologically safe?

If the project were to become a reality, it could—for reasons of cost—only be brought about on an international basis (there is a demand for about 350 aircraft worldwide. And since Mitsubishi has already laid out its own engine program for the supersonic, the Japanese, in the opinion of Dasa head Juergen E. Schrempp, must be brought into the consortium.

News of the German Aerospace pilot was apparently well received in Tokyo. In the Japan International Aerospace '91 of 14 to 18 February 1991, the 71-year-old Mitsubishi Heavy president Iida offered his guest Schrempp a workable opportunity: "I have become quite old in the meantime," the powerful Mitsubishi manager grinned, "and can no longer father children. I have therefore decided to have a baby with Dasa." What is clear is that Japan wants the turnover of its aviation and space industry to climb from the present \$12 billion to over \$40 billion in the next ten years, chiefly through Mitsubishi, and Dasa is to participate in it.

In October, however, it will not just be the concerns of the venerable Iida that will be on the agenda of the summit meeting. Much more important will be the fact that for the first time Nippon's sons will concluding projects with a partner in which not just cooperation in technology is involved, but common products as well. And that will have consequences. "Secretly copying and marketing alone, as the Japanese have so masterfully understood to date, does not work," a Daimler manager commented, rejoicing slightly at the success the negotiations have achieved so far.

Possibly the Financial Times, in its evaluation of the Daimler-Mitsubishi alliance, was right after all: "Nothing less is involved than the worldwide future of the automobile, aviation and space, and electronics industry."

Mitsubishi Official Interviewed

91WS0359B *Munich Industriemagazin in German*
May 91 pp 33-34

[Article: "The Frontier Barriers Are Being Removed"]

[Text] *Industriemagazin* spoke about the motives, intensity, and quality of the strategic alliance between the Mitsubishi Group and Daimler-Benz with the vice president of the Mitsubishi Corporation, Takeshi Eguchi.

Industriemagazin: Mr. Eguchi, over a year ago, the Mitsubishi Group and the Daimler-Benz Concern agreed to cooperate in a number of business ventures. What were the motives for Mitsubishi to take this step?

Eguchi: Since 1933 the political desire of Europe has been to create a single domestic market. And the reality is—in our view—that the relaxation of tensions between East and West is proceeding rapidly. Consequently we have made the right decision in seeing that economic borders worldwide are being gradually removed. The moves by Daimler-Benz and Mitsubishi to build up

mutual relations must be seen against that background. In any case we expect that both groups of companies will receive positive impulses from the joint activities.

Industriemagazin: Can you be more specific about these "positive impulses?"

Eguchi: We believe that Daimler-Benz will serve as our strategic bridgehead to the European market. To reciprocate, we are ready to help our partner from Stuttgart gain entry to the Japanese and Asian markets. That is the most important first object for both sides. Beyond this, besides Europe, Japan, and Asia, we also want to cooperate globally.

Industriemagazin: Does that mean that relations with Daimler-Benz will have a special quality?

Eguchi: This question cannot be answered today. We use the expression "familiarization" for the present phase of the talks; this I equate with getting to know each other. During the "familiarization" period, we will discover the areas in which we can reasonably work together and to our mutual advantage. Only after that can the intensity of the relations be determined, and then we will also evaluate it qualitatively.

Industriemagazin: As far as the "intensity of the relations" is concerned, are you considering the possibility of mutual equity participation [shareholding] between individual Mitsubishi companies and Daimler-Benz companies?

Eguchi: We see no need for that at the present time. But in the case of the Mitsubishi Corporation, and I can only speak for this company at the present time, I would not totally rule it out. In the first instance, I can only imagine equity participation or shareholding in certain projects.

Industriemagazin: How are we to understand that?

Eguchi: By that I mean projects for which we could possibly establish joint companies.

Industriemagazin: What projects are you thinking of?

Eguchi: Of course, we still do not have specific ideas, at best a few visions.

Industriemagazin: Please share your visions with us.

Eguchi: Unfortunately, at this stage I cannot say anything.

Industriemagazin: Is not the planned union with Daimler-Benz itself of a special quality, because for the first time a foreign concern is negotiating with a number of Mitsubishi companies together?

Eguchi: To be sure, this is a new development.

Industriemagazin: Mr. Eguchi, Mitsubishi is cooperating worldwide with many companies. As examples I can name the relationship with Chrysler, which led to equity

participation of the U.S. automobile producer in Mitsubishi Motors Corporation, or the connection of Mitsubishi Heavy Industries with the U.S. aircraft manufacturer Boeing. Is there not a danger that the approach to Daimler-Benz will affect one or the other of these cooperative ventures?

Eguchi: Mitsubishi has a long tradition of working together with international companies. The cooperative ventures with Boeing or Chrysler that you have mentioned are only two randomly selected examples. We have many such international ties. And the relationship with Daimler-Benz will be another, hopefully a good, connection. However, it will have no effect on the other cooperative ventures and consequently will not affect them.

Industriemagazin: In the so-called Friday Committee, the top board members of the Group, 20 of the 160 Mitsubishi companies are represented. Daimler-Benz will be cooperating with four of them. How do the remaining 25 companies in the Group evaluate the cooperative venture with the German technology company?

Eguchi: We have set no limitations. That fact that only four Mitsubishi companies are in the same boat as Daimler-Benz results solely from the fact that they all have identical business interests. If in the future it would seem advantageous that other Mitsubishi companies join Daimler-Benz in joint projects, there is nothing to prevent it.

Industriemagazin: Are you thinking of the Mitsubishi Bank, that could finance such undertakings?

Eguchi: If this were possible, we would of course have nothing against it. Logically, that would mean that the circle of Mitsubishi companies cooperating with Daimler-Benz would grow larger.

Industriemagazin: Six years ago in Singapore you defined six projects slated for cooperation with Daimler-Benz. To what extent have these projects been finalized up? Which of them could be finalized at the planned summit talks in the Fall?

Eguchi: We are currently negotiating about the defined undertakings. Take, for example, global sourcing, which concerns the Mitsubishi Corporation. The working groups are currently probing all possibilities intensively. In Singapore we established the basic outlines and in February of this year in Munich, we negotiated specifics, going into all details. The other projects with the Mitsubishi Motors Corporation, the Mitsubishi Electric Corporation, and the Mitsubishi Heavy Industries are also currently being negotiated. I am convinced that we will be able to conclude some of these projects at the Fall meeting.

Industriemagazin: Is there a priority list? Which of these projects, in your opinion, will be realized most urgently?

Eguchi: First I must say that all of the projects have their own specific character, and consequently have different priorities. Just think of the possible cooperation with Dasa in the field of future aircraft. This project, by its very nature, will require a very long preparatory period.

Industriemagazin: Mr. Eguchi, holding companies are not permitted in Japan. How then does the cooperation between numerous Mitsubishi companies function, if there is no common roof?

Eguchi: We have no holding companies because this type of organization was forbidden us after the war. And even today we cannot establish holding companies under our own legal system.

Industriemagazin: The Mitsubishi companies, however, maintain mutual equity participation [shareholding], and the presidents of the 29 key companies of the Mitsubishi Group meet regularly. Would not an umbrella company simplify matters?

Eguchi: To be sure, the individual companies of the Mitsubishi Group maintain different relations with each other, however they only have mutual equity participation in different ratios. This is a method to express the friendly relations to each other.

Industriemagazin: And do you trace the success of the Mitsubishi Group to this simple formula?

Eguchi: The relations between the companies are very multilayered and do not lend themselves to a simple formula. But perhaps we can trace our success back to that.

Industriemagazin: How often do the 29 members of the Friday Committee meet?

Eguchi: Once a month.

Industriemagazin: And who is the head of the Friday Committee?

Eguchi: We do not use the expression "head." We prefer to call him the representative caretaker. And at the present time he is Mr. Mimura, Chairman of the Mitsubishi Corporation...

Industriemagazin: ...who however has no executive function in the Mitsubishi Corporation in the sense of American CEO's [chief executive officer].

Eguchi: Mr. Mimura is chairman at the Mitsubishi Corporation, the president, Mr. Morohashi, exercises the executive function.

Industriemagazin: The individual Mitsubishi companies do not have boards of directors. Who appoints the executive officers and who controls them?

Eguchi: The managing board elect its own president and a chairman. New members of the board have to be elected by the shareholder meeting.

Industriemagazin: Mr. Eguchi, a final question on the time schedule. When do you think the planned cooperation will yield its first fruits?

Eguchi: We view the cooperation as a very sensible approach. Depending on the specific project, each of the four Mitsubishi companies cooperating with Daimler-Benz will realize the goals of that project sooner or later.

Industriemagazin: Do you set a time frame for the realization of the cooperation?

Eguchi: I refer back to my key word "familiarization." This process of togetherness has just begun.

Philips, Ericsson Cooperate in Mobile Communications

91AN0413 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 25 Apr 91 p 9

[Text] Philips and the Swedish telecommunications company Ericsson have reached an agreement in the area of mobile communications systems.

Both companies will share patents and exchange technical data. Ericsson and Philips expect this agreement to contribute to a rapid implementation of mobile communications systems based on European standards. According to the companies, the removal of barriers between manufacturers based on patent rights will lead to a larger number of systems suppliers and the accelerated implementation of internationally standardized mobile communications systems.

The bilateral agreement covers know-how regarding mobile communications infrastructure and related user equipment, such as mobile telephones.

Philips' contribution includes patents for mobile radio systems, whereas Ericsson will bring in know-how and patents relating to systems and interfaces.

Italy, Japan Sign Telecommunication Cables Accord

91MI0274 Milan ITALIA OGGI in Italian 4 Apr 91 p 11

[Text] Pending the resolution of the never-ending story with Continental, and at a time when the news from the tire industry continues to be unexciting (the recent figures from Pirelli Tire Holding), Pirelli is playing its cards in the cables sector by signing the first Italian-Japanese agreement in the telecommunications cable sector. Pirelli has reached an accord—the first in this sector with a Japanese company—with Fujikura Limited to establish a joint venture company for the production and distribution of electric cable connectors for telecommunications systems. The news was made public by a Fujikura spokesman who added that the headquarters of the mixed company, to be called Servocavi S.p.A. [Incorporated], will be in Leghorn.

Pirelli will hold the majority share (51 percent), while Fujikura will hold the remaining 49 percent. With a capital of 2.5 billion lire, Servocavi S.p.A. will begin production of heat-reduceable insulator tubes in 1992, and will have an initial annual sales target of 15 billion lire. The Fujikura cable group is one of the most important Japanese cable manufacturers with 10,000 employees worldwide and a 1990 turnover of about \$2.5 billion.

Pirelli, underlining the importance of the agreement reached with Fujikura, noted that development prospects in the sector of products for advanced technology cables are excellent within the EEC. Italy, in particular, was until now an importer of these items.

According to the Milan-based company, the agreement forms part of a much broader set of initiatives undertaken by the Pirelli group to resolve the employment problem in Leghorn following the termination of the production of paper-insulated urban telephone cables by Sice.

UK's ICL Buys Finland's Nokia Data

91WS0383A Paris LE MONDE in French 31 May 91 p 30

[Article by C.M.: "Fujitsu Pursues Its Strategy of Conquest"; first paragraph is LE MONDE introduction]

[Text] The British firm ICL's (see LE MONDE 30 May) takeover of Nokia Data, the computer subsidiary of the huge Finnish group Nokia, for 2.3 billion French francs [Fr] confirms the fears of European electronics manufacturers. The Japanese company Fujitsu, which has controlled 80 percent of the capital of main United Kingdom computer maker since the summer of 1990, does indeed intend to use its temporary Community home as a means of conquest.

Just two years ago, ICL was on its last legs. It began sailing under the Japanese flag in July of 1990, and is now back on the offensive. The British computer maker, whose accounts showed a credit balance in 1990, officially announced on Wednesday 29 May that it was going to take over Nokia Data for 230 million pounds (about Fr2.3 billion). Nokia Data is the computer subsidiary of Nokia, one of the biggest Finnish industrial groups and the most highly capitalized company on the Helsinki stock exchange.

ICL is thus grabbing a computer division that is established in Sweden, has sales of nearly Fr8 billion, employs 24,000 workers throughout the world, and—like Nixdorf before its takeover by the German firm Siemens, Olivetti, or Bull—is having serious financial problems. Nokia Data is heavily indebted (it has financial debt of Fr1 billion) and is the only Nokia subsidiary to show a deficit. Its losses are estimated at Fr150 million for 1990. According to certain London City analysts, the latter

were expected to double this year, despite the rationalization plan that was implemented last year and that resulted in the elimination of 650 jobs.

This acquisition—which ICL's directors were careful to point out on Wednesday 29 May was totally financed by the company—will be paid for with cash (Fr500 million) and a minority capital stake for Nokia in the British computer manufacturer. ICL should offer the equivalent of the remaining Fr1.8 billion in the form of preferred shares, amounting to a 5-percent ICL stake for Nokia when the British group is reintroduced onto the stock exchange, theoretically in 1994-1995.

Nokia's sale of its computer subsidiary (the company is very active in telecommunications) goes against the current of recent regroupings—the takeover, for instance, by the American company ATT of its fellow countryman NCR. Such moves are betting on a growing interpenetration of the two technologies. But the sale is explained by the weakness of Nokia's position in the world computer market, and thus by the amount of financial resources the Finnish group would have had to marshal to shore it up.

Nokia has just handed Fujitsu a new card. The merger of ICL and Nokia should create a powerful entity with sales of Fr24 billion, nearly 90 percent of them in Europe. The question is whether any other outcome was possible. Who, of Siemens, Olivetti, or even Bull (with whom Nokia Data had sales agreements), could have made such an acquisition at this time?

CORPORATE STRATEGIES

Grounds for Japanese Investment Strategy in Europe

91MI0253 Duesseldorf HANDELSBLATT in German
14 Mar 91 p 14

[Article by Andres Gandow: "Europe's Chemical and Pharmaceutical Industries Still Considered Superior"]

[Text] Tokyo—In the run-up to the completion of the European single market, Japan's involvement in Europe is gaining breadth and depth: Companies are not only setting up Europe-wide sales and information networks but are also transplanting supplier systems to Europe and commencing operations in preliminary [vorgelagert] production stages (chemical and steel industries) through general trading companies. More and more Japanese companies are setting up special European headquarters to coordinate this complex involvement.

Japanese industry's European strategy is based on comprehensive analyses of the strong and weak points of European competitors. A survey by the Industrial Bank of Japan ("EC 1992 and Japanese Corporations") reaches the following conclusions regarding the branches relevant to Japanese involvement with the EC:

- The iron and steel industry in the EC states is slightly

inferior to the Japanese competition in terms of technological level and productivity, and lags well behind in profitability. Thus crude steel production is only 220 tonnes per employee in the EC as against more than 367 tonnes in Japan.

- The chemical and pharmaceutical industries in the EC are far superior to the Japanese competition in terms of technological level, performance potential, basic research, internationalization of corporate operations, business position in fine chemicals, and productivity and profitability. Six of the top 10 chemical companies on the international market have their head offices in the EC.
- The European textile industry is regarded as slightly inferior in terms of competitiveness. However, the same profit level is attained with lower productivity, and European high-quality clothing suppliers are clearly superior to the Japanese competition.
- The European automobile industry does not achieve the productivity of the Japanese competition. Middle-market cars are less, although only slightly less, competitive. Profitability too is slightly below the Japanese level.
- European producers of consumer electronics, office automation systems and equipment, and electronic components are inferior to the Japanese competition and their dependence on supplies from overseas is increasing. European companies mainly lag behind Japan in productivity and profitability. The lag in technological level and product quality is only limited.
- European suppliers of telecommunications systems are technologically advanced, and productivity and profitability match the Japanese level. They are highly competitive. In contrast, information technology is heavily dependent on external supplies, and particularly on American manufacturers for mainframe computers. On the whole, competitiveness is slightly below the Japanese level here.
- In the machine tool and building machinery industries EC manufacturers and the Japanese suppliers are at about the same technology and profitability levels, whereas there is a slight lag in productivity. European companies show a particularly high level of technology and quality in large-scale plants.
- The European food industry is sufficiently competitive. It is difficult for an outsider to enter the market because the multinational concerns operating in this sector have already developed an omnipresent European distribution system.
- The building industry: European companies are on a level comparable with Japan in terms of technological level, productivity, and profitability.

In the light of its study, the Industrial Bank of Japan assumes that direct investment by Japanese companies

will further increase once the single EC market is established. The ground that Europe needs to make up requires considerable technology transfer so that products for industrial mass production of automobiles, consumer electronics, and electronic components may be developed. The bank explains that this technology transfer will take place through the transplantation of key manufacturing operations, the establishment of R&D and design centers, and the development of efficient suppliers.

A Nomura Research Institute survey of how Japanese companies operate in Europe defines three business policy and organizational goals pursued by Japanese companies:

1. To establish a "fully integrated presence as EC insiders" ranging from research/development and design via manufacturing to Europe-wide coordinated marketing and the creation of efficient customer service systems. The purpose of having development and manufacturing operations is to create original European products that can be marketed worldwide.
2. To organize efficient sales, Europe-wide inhouse information exchange, and accounting systems.
3. To bring on staff that can be assigned throughout Europe.

In the course of their intensive European involvement, Japanese companies establish new European headquarters or expand existing ones to perform four tasks in particular:

- Management support in preparing for and launching new operations in the subsidiaries;
- Coordination of European development, manufacturing, and marketing operations, ensuring that they are in line with the global strategy set out by the company's head office in Japan;
- Provision of executive services for the European subsidiaries (logistics, information, personnel, legal affairs, coordination of public relations work in the broader sense), and
- Controlling the company's entire involvement in Europe.

The European headquarters are financed out of contributions by the subsidiaries for managerial services, allocations from company headquarters in Japan, or financial transactions of their own.

The European headquarters also control the Japanese companies' business in central and eastern Europe, only business with the USSR being handled directly from Japan. There is particularly strong interest in the CSFR, Hungary, and Poland, both as sales markets and as industrial partners. Interest in Romania and Bulgaria, on the other hand, is merely secondary.

Some Japanese companies prefer to enter central and eastern Europe from bases in Germany, especially in the new federal laender. However, other companies regard

Vienna as the best base for their business in Poland, the CSFR, and Hungary, all of which is of a long-term nature.

The firms that the Nomura Research Institute cites as exemplary implementers of an effective European strategy include Matsushita

Electric Industrial Co. Ltd., Mitsui & Co. Ltd. general trading company, Kyocera Corporation, which produces industrial fine ceramics and is also extensively engaged in optics and information technology, Omron Corporation, which manufactures measurement, control, and information technology systems, and the building machinery manufacturer Komatsu Ltd.

- Panasonic Europe (Headquarters) Ltd. in the United Kingdom, which was incorporated towards the end of 1988, acts as central command for Matsushita Electrical Industrial's European operation. With a staff of about 80 employees (50 percent Japanese), it manages a total of 32 European subsidiaries covering sales (11), production (17), R&D (two), and finance (two) with a total income equivalent to about 4.8 billion German marks [DM]. The chairman of this company has a seat in the parent company's top management in Japan as head of the Europe/Africa division.

The European headquarters' work falls into five areas: corporate planning (including public relations work and the direction of European consultants), management (including accounting), personnel (including personnel development and training), marketing/sales for overall control and support of the individual companies, and manufacturing (supporting the individual companies) and control of R&D work (most of which is currently performed at Office Workstations Ltd. and D2B Systems Co. Ltd. in the United Kingdom) via a future Technical Center/Europe.

- Mitsui & Co., one of Japan's top general trading corporations, set up Mitsui & Co. Europe Ltd. in the United Kingdom back in 1974 as its European headquarters, which now controls nine subsidiaries and 23 representatives (nine in central and eastern Europe and 14 in Africa). However, the European subsidiaries' holding company is Mitsui & Co. International (Europe) B.V. in the Netherlands. The head of the European headquarters is a member of the Japanese parent company's board. Just 25 of the European headquarters' 30 or so employees come from Japan. The trading company's total European sales amount to the equivalent of about DM45 billion.

The organizational structure covers all areas of a corporate headquarters, and has a "product/merchandise monitoring department" that is worth a mention. Its job is to ensure strict compliance with the global product/merchandise strategy developed by the general trading corporation at its Japanese head office.

Late in 1988, Kyocera set up Kyocera Europe GmbH in Germany as its European headquarters controlling

the operations of eight sales subsidiaries in Europe. In Germany these are Kyocera Fineceramics (formerly Feldmuehle Kyocera Europe Electronic Components), Kyocera Electronics Europe, and Yashica Kyocera with subsidiaries in Austria and Switzerland. New acquisitions ELCO Electronics GmbH and AVX Ltd. represent an additional involvement in Europe. The European headquarters, which primarily fulfills a supervisory and support role, has a staff of seven.

The projects handled by the European headquarters include launching ceramic tools onto the market, setting up a production base for laser printers in France, and taking over the former joint ventures with Feldmuehle. In addition, this base is engaged in drawing up medium-term European strategy (sales, investments, personnel), coordinates European price policy, and is responsible for devising an inhouse information and reporting system in Europe.

- Omron Corporation's European headquarters, the Omron Management Center of Europe B.V., was set up in the Netherlands at the end of 1988. Three Japanese employees coordinate the operations of 22 subsidiaries. These are mainly sales companies covering process control, sales and accounting systems, medical technology, and office automation systems, although they also include two manufacturing and one finance company. Total European sales amount to the equivalent of well over DM0.5 billion. There are plans to expand this base into a fully-fledged European headquarters over the next few years.
- At Komatsu Ltd. the European business of its five subsidiaries (manufacturing bases: Hanomag AG and Komatsu UK Ltd.) is coordinated by N.V. Komatsu Europe International S.A. in Belgium (five of the eight employees have been seconded from Japan). Total sales in Europe amount to the equivalent of about DM1.3 billion, approximately half of which is produced in Europe. Routine business is coordinated at monthly conferences on the basis of a revolving production and sales program that is largely established at the local level. Six managerial committees representing the subsidiaries also play an important role in coordinating business policy; they cover material procurement/purchasing, product planning/design, manufacturing, marketing/logistics, accounting/finance, and the information system (the latter's task being to organize an inhouse data and information network).

Alcatel-Alsthom Announces Reorganization

91WS0290A Paris LE MONDE in French 5 Apr 91
p 27

[Article by Annie Kahn and Dominique Gallois: "Alcatel-Alsthom Shows 20-Percent Increase in Profits in 1990"; first paragraph is LE MONDE introduction]

[Text] Following Alcatel-Alsthom's good 1990 showing (revenues unchanged at 144.1 billion francs [Fr], net

profits up 20 percent to 7.2 billion), the group's president, Pierre Suard, expects 1991 to be a harder year. On Wednesday, 3 April, he announced the reorganization of the group, involving the simplification of its command structure through the absorption of three subsidiaries (LE MONDE 4 Apr).

Despite the stagnation of earnings at Fr144.1, Alcatel-Alsthom (formerly CGE) has announced profits of Fr7.23 billion—a 20-percent increase over the preceding year (adjusted for changes in accounting methods). In making this announcement, Pierre Suard was able to give himself good marks: "Last year was a major turning point in the history of our group, which we were called upon to administer in a difficult economic environment." While scarcely prolix about the reasons for this performance, he did stress the good results obtained in the communications systems area, one of the three industries (communications, energy, and transportation) on which the group is now concentrating. In public-sector switching in particular, orders rose by around 30 percent. On the other hand, business communications are a matter of some concern for Alcatel-Alsthom's CEO. The group's activities have slowed in this sector, in which it also has "an insufficient margin." The same appears to be true of large batteries and railway activities in Spain.

Pierre Suard expected "a harder year" in fiscal 1991. Difficulties related to the economic downturn could be amplified by the unequal position of European firms vis-a-vis the American and Japanese competition. He criticized a certain "state of mind" currently prevailing in Brussels: "We should not make the single market any more open than the competing markets are. European industries should not be saddled with constraints that apparently do not apply to their competitors." The agreement he signed 6 months ago with Fiat is still awaiting the Commission's approval. "Meanwhile, Canada's Northern Telecom has acquired Britain's STC through a takeover bid, even though Northern Telecom cannot be controlled by foreign capital under Canadian law, which protects companies with franchises in the telecommunications sector."

Absorption of Three Subsidiaries

Mr. Suard has decided to simplify further the group's financial structure by absorbing three of its subsidiaries, Generale Occidentale (communications), Locatel (electronic equipment leasing), and SAFT (accumulator battery manufacturing). This means that merger proposals will be made to these firms. The equivalencies chosen are four SAFT shares to nine Alcatel-Alsthom shares, three Locatel shares to one Alcatel-Alsthom share, and three Generale Occidentale shares to four Alcatel-Alsthom shares. These equivalencies show a 15-percent premium for the three securities in question based on the average rate over the last 20 market days.

These operations will increase the number of Alcatel-Alsthom shares by 8 percent. More importantly, unlike

Paribas' merger proposals on Poliet and Ciments Francais, they will boost the group's internally controlled stock from 5 percent to approximately 6.5 percent. After affirming the necessity of internal control for corporations, Mr. Suard went on to recall that the new law on this subject, effective 1 July, does not forbid this practice. It only makes the shares concerned nonvoting.

"This is solely a financial reorganization," Mr. Suard insisted. Absorbing SAFT and Locatel will make it possible to recapitalize these two concerns, which are going through difficult periods. SAFT registered losses of Fr33 million last year, while Locatel recovered slightly, with profits of Fr4 million. Excessive stock issues apparently reduced these firms' net earnings per share. The absorption of Generale Occidentale (GO) caps a takeover process begun last year and gives the group access to GO's Fr1.9 billion in liquidities. According to Mr. Suard, this amount must be "relativized" in the light of Alcatel-Alsthom's net liquidities of 6 billion.

France: Thomson-CSF Expands Optronics Activities

91AN0343 Paris *ELECTRONIQUE INTERNATIONALE*
HEBDO in French 21 Mar 91 p 7

[Article signed P.A.: "Thomson-CSF Boosts Its Optronics Activities"]

[Text] The French manufacturer is purchasing 50 percent of the stock of the British firm Pilkington Optronics, thus strengthening its activities in the field of today's latest optronics technology.

In fewer than two years, optronics has become a key technology at Thomson-CSF. After the influx in 1989 of the expertise of TRT, the Philips group's defense division, Thomson is now looking to Great Britain to further expand its optronics activities. The French manufacturer has just signed a contract with the British group Pilkington plc involving the purchase of 50 percent of Pilkington Optronics' shares. According to Thomson, the cost of the transaction amounts to slightly over half of the company's net assets. This stake should strengthen Thomson-CSF's position as number one in optronics in Europe and also places it fourth on the world tables behind Hughes, Martin-Marietta, and Texas Instruments.

This is a strategic agreement for Thomson at a time when military optronics equipment has just proved its efficiency during the Gulf war. "The joint capabilities of Thomson-TRT Defense and Pilkington Optronics should enable us to respond to this new demand," points out Thomson. Thomson, which was originally specializing in target-stalking and missile-guiding equipment (such as the laser-guided Atlas target indication pod or the Ariel home device), acquired its expertise in tank or helicopter vision systems from TRT, especially in the field of thermal imaging cameras (Castor, Victor, and others). Pilkington Optronics, which realized a turnover of 83 million pounds, focuses more specifically on

optics, an activity which, according to Thomson, "complements Thomson's own more electronics-oriented skills": night/day vision systems, components for head-up and head-down displays, periscopes, etc. This agreement should also improve Thomson's position in Great Britain, a country which represents about 30 percent of the European optronics market, and give it easier access to the Commonwealth and United States markets.

Two European optronics centers are now taking shape. The French Telecommunications Corporation (SAT) has just established another expert center after signing agreements last year with the Italian firm Officine Galileo and the British company Thorn-EMI. Furthermore, SAT is prime contractor in the SATEL consortium, which is involved in several European programs (the Condor 1 thermal imaging system for the third-generation long-range antitank weapons (AC3G-LP) of the French-German Tigre combat helicopter, for instance). Thomson-TRT Defense is, for its part, developing the infrared-imaging homing device for the AC3G-LP and has just committed itself, with SAT, by responding to a call for proposals which has just been launched for the Frontal Sector Optronics (OSF) project of the Rafale, Dassault's future fighter aircraft.

SGS-Thomson Calls For EC Chip Venture

91AN0319 Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 21 Feb 91 p 11

[Article: "Chip Manufacturers Must Combine Their Production Efforts"]

[Text] SGS-Thomson, the French-Italian chip manufacturer, thinks that a partnership with Philips and Siemens in the field of memory chip production is the only way to survive in the long run. In 1990, the three European chip manufacturers suffered severe losses.

The European chip industry has no bright prospects. Several years of accumulative losses have led Philips to abandon the development of specific types of chips. Siemens' losses have increased by 20 percent, now reaching several hundred million marks a year, and SGS-Thomson, which made a small profit in 1990, has plunged back into the red.

The president of the French-Italian company, Pasquale Pistorio, urges the European chip industry to form a united front to face Japanese supremacy. He says he has not taken any such initiatives so far, because the matter is far too delicate. The three European companies are already cooperating on the future chip generation within the framework of the Joint European Submicron Silicon Initiative (JESSI), but Pistorio deems this kind of cooperation insufficient. Individually, each of the three chip manufacturers is too small to continue to take a key position on the world market, and they are certainly not capable of selling chip products with a profit. Nevertheless, the manufacturers consider the mastery of chip technology to be vital for the survival of the European electronics industry. Chips are increasingly being used in

domestic appliances, for instance; without chips, Europe would become increasingly dependent on Japan.

Japan, Korea Plan Investments in Former GDR

91MI0254 Duesseldorf HANDELSBLATT in German 18 Mar 91 p 6

[Text] Tokyo—Japanese trade and industry's present involvement in the five new federal laender and Berlin is marked by the establishment of sales and customer service centers in the automobile and electrical industries. Considerable involvement can also be seen in the service industries.

Present and future operations on the part of Japanese companies will thus be supported and independent business potential opened up. Last but not least, there is already a limited number of cooperation agreements with partners in the federal laender.

To foster these activities, at the beginning of this year the German Chamber of Industry and Commerce compiled a comprehensive 200-page dossier on the new federal states entitled "Basic Economic Data and Trends," which informs potential Japanese investors in detail about investment conditions in eastern Germany. However, there has to date been no proper presentation by the Treuhandanstalt [the holding company arranging privatization of state-owned enterprises in eastern Germany] in Japan. When one does appear, it should take pains to refute the criticism sometimes heard in Japan as to the agency's bureaucratic methods.

But on the whole the new federal laender are not virgin territory for the major Japanese companies. Back in the early seventies, the seven leading Japanese general trading companies had signed long-term consortium agreements with foreign trading companies in the GDR. Moreover, production plants in the former GDR, especially chemical and steel works, had been modernized by Japanese plant construction companies and several building projects, including three hotels, completed.

Brokerage Firms Seek Participation in Privatization Transactions

Automobile manufactures Toyota Motor, Nissan Motor, Honda Motor, Mazda Motor, Mitsubishi Motor, and Yamaha Motor (motorcycles, alongside its parent company Yamaha Corporation, which is also in the musical instrument business), and entertainment electronics companies such as Sony, Pioneer, JVC, Hitachi and Matsushita ("National Panasonic") in particular are currently engaged in establishing sales and service networks.

In the industrial sector, companies such machine tool manufacturers Yamazaki Mazak and Okuma are endeavoring to consolidate their presence in eastern Germany, as business had already been done with the former GDR in this sector too. Also, in recent months

the leading building companies have set up bases in Berlin with a view to early involvement in projects in this region.

Besides all this, the involvement of Japanese banks, leasing and real state companies, general trading houses, securities and insurance companies, and freight companies in the new federal laender and Berlin is a sure indication that eastern Germany is considered of prime importance in the future European economic zone and that the presence of Japanese production companies there can be expected to expand considerably in the future.

The leading Japanese brokerage house Nomura Securities, no less, has made it clear that its engagement in Berlin will open up new business opportunities; these include involvement in privatization and financing operations, and introductions onto the stock exchange, venture financing business, asset and real estate management business, advising Japanese investors, and assistance with business acquisition and investment. There is also considerable Japanese interest in participating in urban development projects in Berlin (building shopping centers), laying out golf courses in the Berlin area, and cooperating in the construction of a major international airport to the south of the city.

Spectacular joint projects in the new federal laender, some of which are still in the planning stage, with partners from Germany or other European countries include:

1. The construction of an oil refinery in Rostock by the Marubeni general trading house and Toyota Engineering;
2. Technology transfer and joint production of heavy diesel motors at the Rostock Motor Works: Mitsubishi Heavy Industries;
3. Joint marketing with Florena Waldheim (previously State Cosmetics Combine): Goldwell/Kao;
4. Contract production of video equipment components at Stern Radio: J2T/JVC;
5. Joint venture for the production and sale of printing inks with the Halle Combine: Sun Chemical/Dainippon Ink and Chemicals;
6. Telefax production under contract at Robotron: Nissei Opto, MEI Japan.

For at least some of the companies, the expansion of their presence in eastern Germany is also seen in the context of the opening up of other central and eastern European markets. A survey by the Nomura Research Institute, one of the leading economic research institutes in the country, which has close contacts with industry, cites the following two motives:

1. Exploitation of long-standing trade and logistic relations between the former GDR and other countries in the same region for their own business;

2. Exploitation of the expertise in opening up markets in the new federal laender acquired by the sales community that has existed to date in the previous Federal Republic for further activities in central and eastern Europe. Another group of the companies regard Austria as another important base.

As far as the involvement of Korean companies in the new federal laender is concerned, the six representatives of the chambers of trade and industry from Mecklenburg Vorpommern, Brandenburg, Saxony-Anhalt, Thuringen, and Saxony who took part in the "Technogerma Seoul 1991" German trade exhibition in late February and early March reported "extraordinarily strong interest" in current developments in eastern Germany.

Korean Delegation at the Leipzig Trade Fair

There were also very concrete questions from individual companies concerning investment sites, although there have as yet been no concrete results. However, participation proved worthwhile and will continue at the planned "German Trade Fair Seoul 1992" consumer goods exhibition.

The head of the German-Korean Chamber of Industry and Trade, Florian

Schuffner, announced that the Korean state foreign trade organization, Kotra (a subdivision of the foreign trade ministry), will now also visit the Leipzig Trade Fair and will send a delegation to Erfurt at the end of May: "This shows that the Korean state is promoting these efforts to a certain extent." For the present, however, caution prevails among companies, and their primary interest is in trade and marketing, particularly in consumer electronics. Schuffner does not believe that direct investment is really to be expected.

German Industry Fast Losing Innovation Lead to Japan

91GE0217Z Duesseldorf WIRTSCHAFTSWOCHE
in German 5 Apr 91 pp 38-50

[Article by Hans Peter Canibol, et al.: "Analysis of World's Most Innovative Firms Shows Japanese Rolling Up Key Markets Deliberately and Thoroughly"]

[Text] They are looking for firsthand knowledge—and finding pitying smiles: When teams of researchers from Daimler-Benz and other German concerns have Japanese information translated into German, they often find that Japan's engineers do not attach very much importance to Western ingenuity. Yotaro Iida, the chairman of Mitsubishi Heavy Industries Ltd.—Daimler-Benz's desired partner—has even publicly sneered at Daimler subsidiary AEG, saying that some of the products that it develops have long since been

standard at Mitsubishi. Attacking Japanese domains is no longer a subject of discussion at German corporate headquarters. Now, all talk centers on defense.

Concern is felt most of all about the rapid pace of Japanese competition in developing marketable products. "If I can do it faster, I can also do it cheaper," says Hans Westphal, CEO of the medium-size machine tool manufacturer Werner & Pfleiderer GmbH in Stuttgart, describing the critical situation. There is no doubt that Japanese companies are clearly setting the standards in the competition surrounding innovation. A study of the most innovative companies in the world shows that Japan's concerns are in the lead: Of the 10 most innovative business conglomerates on the international market, five are from Japan, four are from Germany, and only one—IBM—is from the United States.

Even though the company ranking may appear reassuring at first glance, it is nevertheless deceptive. It is only after a specific analysis of sectors that the major weaknesses of the Germans are revealed. It is true that they dominate the traditional domains. In the development of new products and manufacturing processes, German mechanical engineering is even in the lead in terms of worldwide inventions, with a share of nearly 30 percent. In the key computer industry, however, German manufacturers show the greatest weaknesses, with only just under 10 percent of all ideas. And even in electrical engineering, German inventors are far below the average of all sectors, with around 16 percent.

The big star in the firmament of German technology is Munich's Siemens AG. It is just behind the leader, Japan's Mitsubishi Group. Siemens can thank its strong position in electrical engineering for its good score—quite in contrast to the sector assessment. Around 1,800 of the 2,400 inventions by multinationals classified as relevant by Isar in the WIRTSCHAFTSWOCHE study come from this growth sector that is so critical to the future. Consequently, Siemens chief developer Hans-guenter Danielmeyer has a self-confident attitude: "We are the only European firm capable of manufacturing 16-megabit memory."

Even the Japanese concerns are falling far behind Siemens in electrical engineering. In the number two slot is Toshiba, from whom Siemens in fact acquired the know-how and the production technology for the one-megabit memory chip, at a price of just under 100 million German marks [DM]. Worldwide innovation leader Mitsubishi is in third place in this sector evaluation. The next German corporate groups trail much further down the list. Robert Bosch GmbH in Stuttgart barely manages to occupy the number 10 position.

The Germans are also the best in their class in other sectors. With the acquisition of subsidiaries MBB, MTU, and Erno, Daimler-Benz was transformed into the technology giant in aerospace technology. Hoechst AG, with its subsidiaries—Celanese, Behringwerke, Wacker-Chemie, Roussel, Herberts, Uhde—occupies the top

position in chemicals and pharmaceuticals. And as far as automobile manufacturing and suppliers are concerned, Bosch preserves the honor of German engineering. The Mercedes researchers, who hawk their goods with the slogan "We sell the best cars in the world," are down in fifth place.

Top Ten: The Most Innovative Concerns in the World (Number of Inventions in 1987/88)

1. Mitsubishi	2,522
2. Siemens	2,433
3. Hoechst.....	2,403
4. Hitachi.....	2,396
5. Toshiba.....	2,118
6. Bayer.....	2,067
7. IBM	1,816
8. BASF	1,794
9. Canon	1,705
10. Fuji	1,542

Source: Ifo/GBI

The technological lead of today decides the market strength of tomorrow. Anyone who wants to survive international competition must be a trendsetter. The German export successes of recent years are the most convincing proof of this, but they are based for the most part on inventions from previous years. According to calculations by the Fraunhofer Institute for Systems Technology and Innovation (ISI) in Karlsruhe, western German industry exported twice the amount of research-intensive products as the amount of imports that entered the country. The balance was negative only with respect to Japan.

German assets have been in jeopardy for some time, however. In order to counteract misdirected efforts, the development trends have been under observation by numerous economic institutions commissioned by Heinz Riesenhuber, the minister for research and technology. ISI chief Frieder Meyer-Krahmer: Patent applications indicate the "future market position." They are considered indices for medium- and long-term competitiveness.

And in that area, the Germans are increasingly falling behind. According to calculations by the Ifo Institute, the share of worldwide inventions accounted for by western German companies in 1987 and 1988 was 18.9 percent. In the competition of nations, the FRG lags far behind in third place—after the United States (25.7 percent of the world share) and Japan (23.9 percent). Only 10 years ago, German inventors were doing significantly better. At the beginning of the 1980's, they were

still number two, with a share of 19.6 percent, ahead of Japan (19.1 percent) and behind the United States (28.1 percent).

"In the meantime," according to the assessment by Ifo patent experts, "Japan has even pulled ahead of the United States." It is scarcely possible any more to catch up with Japan's researchers. Only recently, the American Council of Competitiveness warned of "serious dangers to the country's economic future and national security." According to the Council's analyses, the United States is so far behind in a third of 94 technologies that are critical to the future that in five years it will no longer play any role on the world market.

The EC Commissioners in Brussels have also noted with shock that "despite intensive efforts, the development lag is increasing." Detlev Samland (SPD [Social Democratic Party of Germany]), a member of the European Parliament, even believes that the time has come when it is being decided "whether Europe will play a future role in the productive sector of industry."

A feeling of doom has been widespread throughout the entire European EDP [electronic data processing] sector for some time now. Optimistic exhortations to keep going are like whistling in the dark. Even the notoriously good-humored Olivetti chief Carlo de Benedetti is already pronouncing funeral orations on the former prodigies of Europe's high-tech industry: "Only the three strongest companies will survive the merciless selection process." And Hans-Dieter Wiedig, head of Siemens' Nixdorf Informationssysteme (SNI) proclaims bleakly: "If we can't do it, then no one in Europe can."

Even the head of research and development for IBM Deutschland, Herbert Kircher, calls for "the most important companies to swear to a common goal" in order to overcome the Japanese lead in chip technology. IBM and Siemens are already making a start. Under conditions of strict secrecy, the two computer manufacturers are preparing a trans-Atlantic chip alliance against the Japanese (WIRTSCHAFTSWOCHE, 13/1991). And EC Commissioners Martin Bangemann and Filippo Maria Pandolfi are working on an overall plan for industrial policy intended to save the destitute information sciences and electronics industry from "collapse."

Sector Comparison: Concentrated Inventiveness The three best concerns in individual areas of technology (Number of inventions in 1987/88)

Chemistry	
Hoechst	1,269
Bayer	1,261
BASF	1,147
Aerospace	
Daimler-Benz	246
General Motors	153

United Technologies	137
Machinery and Equipment	
Fanuc	364
Mitsubishi	196
Polygraph	160
Electrical Engineering	
Siemens	1,779
Toshiba	1,553
Mitsubishi	1,520
Metals	
Sumitomo	204
Mitsubishi	165
Degussa	128
Rubber and Plastics	
Bridgestone	192
Sumitomo	140
Goodyear	88
Food/Applied Chemistry	
Unilever	278
Procter & Gamble	113
Henkel	87
Petroleum	
Royal Dutch/Shell	360
Exxon	275
Mobil Oil	198
Automobiles/Suppliers	
Bosch	578
Toyota	569
Honda	505
Computers	
IBM	898
Canon	767
Toshiba	424
Pharmaceuticals	
Hoechst	632
Bayer	351
Ciba-Geigy	321
Photography and Optics	
Fuji	1,041
Eastman Kodak	578
Canon	427

Admittedly, patents are not the only measure of innovation. Moreover, "a technological lead can scarcely be guarded by patents alone," according to mechanical engineer Westphal. Siemens researcher Danielmeyer also downplays the situation: "You have to consider that there are different cultural characteristics in the tendency to register innovations. The company prestige

value of patents is quite pronounced in Japan." But Ifo expert Konrad Faust warns of complacently underestimating the Japanese patent offensive: "The Japanese are creative and aggressive at the same time."

The strategy for success is always the same: First, Far East executives conduct a precise analysis of the strengths of their competitors. Then, the marginal fields of technology are meticulously occupied by less demanding national patent applications, thus blocking access to the local market. In the next step, the Far East companies offer licensed production on their domestic market, and in this way gain cheap access to the key technologies of their naive foreign competitors.

In the United States, which has squandered its lead in many sectors in this way, a process of rethinking is slowly getting under way. Donald M. Spero, president of the high-tech lamp systems manufacturer Fusions Systems Corporation in Rockville, Maryland, warns his fellow countrymen: "Protecting key technology is the main issue and cannot be thoughtlessly put at risk through licensing." Spero resisted massive pressure from Mitsubishi Electric Corporation and refused to enter into cooperative ties with the Japanese. Thanks to the energetic assistance of the U.S. Department of Commerce, Spero even managed to penetrate the Japanese market without sharing know-how with the Asians.

Today, only IBM reflects the former American radiance in technological strength. Concerns on the other side of the Atlantic achieved first place in only one out of 12 sectors. However, no U.S. multinational—not even the biggest computer company in the world—can keep up with the overall winner, Mitsubishi. In the individual evaluations of sectors, the Japanese conglomerate is number three in electrical engineering patents and number two in the metal sectors and in mechanical engineering.

The concern has no equal. Even insiders have a hard time puzzling out the complex structure of this, the largest business conglomerate in the world. Even though the Americans broke up the conglomerate—founded in 1870 by samurai Tsukumo Showkei as a shipyard—after the Second World War, today the giant is stronger than ever, with an annual turnover of DM440 billion and just under 400,000 employees. On paper, the 160 or so industrial companies and around one dozen banks and finance companies generally share only the name. No controlling company guides the fortunes of the multinational. Only every other Friday—and this without interruption for 36 years—do the 29 presidents of the concern's components meet for lunch in Tokyo's Marunouchi section in order to set the Mitsubishi world in order.

Competition between the concern's developers is systematically encouraged. Thus, Takashi Goto, the executive responsible for computers and peripherals for Mitsubishi Electric Europe GmbH in Ratingen, near Duesseldorf, must continually contend with competition

within the group. From time to time, the Mitsubishi companies even attempt to kick each other out, because similar products in the firm's realm are simultaneously thought up, developed, and produced by different parties. The pressure within the concern pays off. Every year, the inventors of the year are chosen, whose patents are naturally transferred to the firm.

One outstanding achievement in recent times came from Masataka Yoshino from Nakatsugawa, who developed a ventilation system for climate-controlled buildings. Thanks to special paper filters, poor air and smoke are filtered out while cold or heat is retained in the room.

Also successful was Nobuo Terasaki from Nagasaki, who created a gigantic television screen called Diamond Vision that, in terms of technology, is not subject to size limitations. The largest models are found at the Nakayama and Fuchu horse-racing tracks (9.6 by 17.92 meters), consisting of thousands of tiny tubes.

Sectors: Share of West German Patents as Percentage of Worldwide Patents

Sector	Percentage share
1. Machinery and Equipment	28.1
2. Automobiles	26.4
3. Metals	21.9
4. Chemistry	20.4
5. Aerospace	20.4
6. Rubber and Plastics	18.5
7. Food	17.1
8. Petroleum	16.9
9. Electrical Engineering	16.3
10. Pharmaceuticals	15.3
11. Photography and Optics	14.2
12. Computers	9.6
Total	18.9

Source: Ifo

Mitsubishi is almost unstoppable. Nevertheless, overall Japanese industrial spending on research cannot cover all areas of technology, despite all efforts to do so. Japan's innovations in the areas of chemicals, pharmaceuticals, food, oil, and aviation are modest. While 42.7 percent of all inventions worldwide pertaining to computers are attributable to the Japanese, the figure for food technology is just 11.6 percent.

This is a small consolation to the Germans. They are especially strong in areas where the Japanese are weak. In chemistry and chemistry-related fields, they occupy the leading positions, even if they lack breadth. As far as know-how in biotechnology—a critical sector for the future—is concerned, the United States is dominant.

Consequently, the somewhat good position of German companies on the world market is in many ways the

result of an adroit takeover policy. The western German chemicals multinationals and Daimler-Benz are textbook examples of this. In contrast, the position of German mechanical engineering firms is homemade and broadly based. Although the two top positions in the sector are occupied by Fanuc and Mitsubishi from Japan, positions three through 10 are held by six German corporate groups: VEB Polygraph, MAN, Bosch, Siemens, Rieter, and Mannesmann. But for how long?

For some time now, the Japanese, with low prices, have been deliberately and thoroughly breaking into world markets dominated by German exporters. And the Japanese mechanical engineers are not some medium-size business with a thin layer of capital investment, but rather financially strong concerns. As in the computer industry, German mechanical engineering will be able to compete and survive in the long run only if it cooperates.

It is no longer with new products that the innovator skims off his income, his reward for advances; rather, it is through optimized, cost-effective manufacturing processes. Although German entrepreneurs are still clearly in the lead in terms of production technology, the situation will become critical if the basic know-how begins to disappear and—as with computers and electronics—migrates to the Far East. Simply filling market niches with ingenious high technology is in the long run not enough for a major industrial nation like Germany.

The Japanese are showing the direction for the future. They are clearly in the lead in high-tech innovations and in efficient organization of mass production. "What concerns me about the Japanese challenge," says Siemens researcher Danielmeyer, "is the highly developed production culture for high-tech products and the consistent orientation towards key innovative markets."

[Box, p 42]

Patents: Only a Fraction Is Significant

Patent applications are among the most important indicators of technological competitiveness. In evaluating patent statistics, however, several obstacles must be negotiated in order to achieve a meaningful result. The Ifo Institute for Economic Research in Munich has developed a method for weighing the importance of the more than one million patents applied for worldwide each year. Because only a fraction of these is actually economically significant.

The Ifo experts proceed from the assumption that the only patents that are relevant are those where international patent protection is applied for. Thus, the Ifo researchers evaluate only those inventions for which there are applications in several countries. For 1988, the patent specialists counted 77,961 inventions.

Since patents are generally published only a year and a half to two years later, it is only then that economic

researchers have the opportunity to analyze the inventions. The current evaluation covers inventions for which patent protection was applied for during 1987 and 1988. Moreover, converting innovations takes time. "In computer technology, manufacturers need two to three years," says Ifo expert Konrad Faust, "and in pharmaceuticals it can take 10 years or longer."

In the application, the patents are assigned to one or more of the 1,627 technology fields of the International Patent Classification, which are in turn combined by the Ifo researchers into sectors—in keeping with the FORTUNE classification.

In the first step, the economic researchers determined in which technology fields the companies of a sector (e.g., the automobile industry) are active. In the second step, they looked at whether the companies account for more than 50 percent of the inventions in a particular field of technology. In this way, the technology is defined not from the ivory tower, but rather from the actual research activities of the companies in a sector.

The Gesellschaft fuer Betriebswirtschaftliche Information mbH (GBI) in Munich calculated the concern figures from the company data exclusively for WIRTSCHAFTSWOCHE. Specifically, the technological potential of the concerns is reflected not only in the inventiveness of the parent companies, but also in the various activities of their subsidiaries. The criterion here is that the parent companies have a controlling interest of 50 percent or more.

The detailed analysis by the Ifo Institute, which provides a full overview of the inventions by the 1,462 most innovative companies in all fields of technology, will be published soon under the title "Competing for the Technology of Tomorrow."

[Box, p 45]

Alliances: Critical Requirements

In mechanical engineering, it is no longer enough to set priorities in individual functional areas of the company. Rather, the winners in the 1990's will be those companies that are able to recognize and universally control the critical market-oriented production processes.

A study by Arthur D. Little International, Wiesbaden, conducted in conjunction with the European Business School, Reichartshausen, shows that five critical requirements define mechanical engineering in the future:

- Achieving the critical company size,
- Time as an increasingly important competitive factor,
- Retaining a leadership role in innovation,
- Consistent quality and cost management, and
- Continual improvement on all levels.

Especially interesting information is provided by questions pertaining to managing the electronics revolution. Over 13 percent of the companies questioned achieve 30 percent of their turnover with software and electronics.

However, for more than a third of the mechanical engineering firms, this source of turnover—although somewhat artificially—accounts for less than 10 percent. This share will certainly increase in the future.

Companies such as Schenck in Darmstadt are already further along in this regard. In the area of weighing systems, the share of turnover for overall electronics at Schenck is around 50 percent. Since mechanics is increasingly losing importance, other capabilities are becoming the critical factor for success: management of software projects, deliberate advanced development of control software, and in-house production or additional purchases.

In deciding on depth of production, in contrast, there is no unified trend. Although a majority of the companies are still putting their money on advances in productivity through even lower added valuation, one-sixth of the firms are moving in the opposite direction.

Sometimes, an increase in production depth clearly makes sense. Thus, Heidelberg's Druck built a modern foundry several years ago, thus increasing added valuation in a critical area, because its quality requirements in serial production were best met in-house. Moreover, the issue of critical know-how that should not fall into the hands of competitors is an argument against purchase.

The evaluation of cooperative arrangements is surprising. Some companies even feel that strategic alliances are a weakness: Such alliances are considered only in an emergency.

However, strategic alliances will gain importance in the future. Mechanical engineering in particular, which is characterized by medium-size companies, can make up for its weakness in terms of inadequate critical company size by developing individual products that fill a niche in conjunction with competitors.

Electronics: Weak in Mechanical Engineering

Turnover share of electronics and software (in percent)	Share of companies (in percent)
0-10	36.7
11-30	33.3
Over 30	13.3
No data	16.7

Source: Arthur D. Little

Cooperation: Emphasis on Selling Reasons for Cooperation Between Companies (Share of total cooperative arrangements in percent)

Overcoming Market Barriers	32.2
Expansion of Operational Network	15.5
Joint Production	13.5
Technology Transfer	10.1
Research and Development	8.4

Source: Arthur D. Little

[Box, p 48]

Mechanical Engineering: New Problem Children

After three years of strong growth, machine and installation engineers in the old Bundeslaender must now face hard times once again. After a growth in real production of 6.1 percent in 1990, the sector will finish 1991 with a real growth of no more than two percent, according to an estimate by the Association of German Machine and Installation Engineering (VDMA).

But even this is an "optimistic prognosis" that is based on "somewhat shaky ground," says VDMA President Berthold Leibinger, CEO of Trumpf GmbH, the mechanical engineering company in Ditzingen. The prediction is based on the order books that are still available, which generally extend around seven months. In addition, domestic consumption—especially from the new Bundeslaender—will probably continue to be subject to positive trends.

Exports, in previous years the draft horse of growth in the sector, will decline. The nominal 1990 increase of around 3.5 percent represents stagnation in real terms. For 1991, Leibinger is expecting a real decline of three to four percent in machine exports. In the process, the various branches will be subject to extremely different trends. "The problem children of recent years, mining equipment as well as agricultural machinery and tractors, will soon have company," says Leibinger. Moreover, the strongly export-oriented areas of textile machines, rubber and plastic machinery, as well as machine tools are experiencing massive competition from Japan.

For the first time, mechanical engineering data from the new Bundeslaender are available. Total turnover during the second half of 1990 amounted to DM16.3 billion, with exports at DM5.8 billion. In 1989, the share of exports in the former GDR was still just under 60 percent—deliveries to the former CEMA states have "genuinely broken down" over the past year.

The prospects of eastern German mechanical engineers are anything but rosy. Productivity is only one-fourth to one-third that of the West. A more pressing concern is that the machines be sellable on the world (primarily Western) markets. At present, suppliers in the new Bundeslaender are concentrating much too one-sidedly on the western German market. "They are driving up and down the highways to sell us their goods," says a VDMA expert. "They have yet to learn that they need other countries as markets as well."

German, International Patent Applications Discussed

Statistics Compared

91WS0272A Duesseldorf VDI NACHRICHTEN
in German 8 Mar 91 p 26

[Article by Gregor Frechen and Peter Friy: "Current Patent Statistics in Key Technologies: For Inventions, the Japanese Are Far Ahead of the Americans and Germans"]

[Text]

A European Patent Protects Against Competition in 16 Countries

Innovative companies need effective protection for new developments. They rely primarily on patents for this protection. Patents ensure an exclusive right to use and thus provide a competitive advantage for a long period of time. Strongly technology-oriented countries such as Germany, Japan, or the U.S. have very different procedures. Now, for the first time, the VDI Nachrichten has collected all applications in these countries into a current set of patent statistics. The key technologies defined by the Battelle Institute of Frankfurt form the basis for the investigation.

The president of the German Patent Office in Munich is worried about the future of German industry. "According to the results of scientific studies, duplicate or late inventions consume up to 30 percent of the monies expended for research and development." In 1989 alone, according to Professor Dr. Erich Hausser, the companies wasted 20 billion Deutsche marks. No one contests these horrendous numbers. While the research and development departments of German companies know about the problem, they say it is not as big as the Munich Patent Office head never tires of declaring publicly time and again.

Hausser does not have a panacea. However, he does have the beginnings of a practical solution. "Thorough observation of patent data is primarily necessary to prevent poor investments in production planning." This is the only way to prevent foreign proprietary rights that appear suddenly from disturbing a company's plan.

This sad picture becomes even worse when Hausser defines the patent application activity of a country as a powerful indicator of the technology-creative and innovative performance. However, in this way things look bad for almost all technology-oriented national economies in comparison to Japan. The patent statistics show that Japanese companies are out in front by a lot more than a nose in all key technologies.

Converting the patent applications to a per capita basis does not help the Germans either. But, they are able to push their American colleagues out of second place. This becomes very clear in the key technology areas of telecommunications and sensor systems/sensors.

Just how is the high number of Japanese patent applications to be evaluated? Dr. Horst Rieger, director of Innovation Consulting for the Chamber of Industry and Commerce in the Stuttgart region urges caution. "No absolute conclusions can be drawn to the quality of the applications from the quantity," he says. That "many patents are junk and thus simply not useable," thinks Rieger, is an often ignored fact.

Even Helge B. Cohausz, a patent attorney in Duesseldorf, puts the top numbers of the Japanese in perspective. "They patent many small development steps. Also, they are forbidden by Japanese patent law, in contrast to German patent law, from combining similar inventions into one application." Even with generous consideration given these arguments, Cohausz emphasizes, "there are still a sizable number of important patents left."

Analyzing the causes is not very flattering for German management. The innovation climate is not right in the companies," found Prof. Dr. Gert Von Kortzfleisch, president of the German Working Group on Education-Invention-Innovation (DABEI) of Bonn recently. Cohausz, the patent attorney from Duesseldorf, formulates it using more drastic terms. "Today, an inventor in German industry is quickly labelled a madman." The reaction of colleagues is very typical in this respect. They generally view new ideas skeptically. This is usually because they think they know it all much better.

The circumstances are completely different in Japan. There, one colleague values the idea of another. The result of this is that fear of mini-patents is not part of their vocabulary. Finally, there is a company hit parade of innovations published regularly. "For every company it is an honor," reports Helge B. Cohausz from experience, "to get good marks in this national competition."

The Japanese use a very similar strategy in the advanced industrial society, too. While the Germans search for the big idea (Cohausz), the sons and daughters of Nippon ensure market advantages for themselves using small supplementary inventions. "The Japanese," emphasizes the biotechnology specialist Rolf Schmidt, "are way out in front in application technology. The results can be seen in the patents."

According to this, for example, the sensor area must still expect surprises. With over 17 thousand applications in the past year, the Japanese are far ahead of the Americans (3464) and the Germans (2036). "This could mean," says Ulrich Fuhrer, chairman of the Working Group on Measuring Sensors (AMA) of Munich, looking toward the future, "that a few things are still heading our way." This is despite the Germans and Americans now occupying the top spots, according to the sales figures.

In PATOLIS (18 million records in the language of the country), Japan has a patent database comparable to the European version INPADOC that is similarly comprehensive. It is also interesting that there were 500,000 initial publications in Japanese in the patent literature of 1988 alone. Combined, German and English contributions made it to just about 230,000.

All this does not suggest Japanese engineers had more ideas than Americans or Germans. They just chose a path consisting of small steps. For German companies, besides their reluctance to apply, another irritating circumstance is "that for many engineers the term 'patent

literature' is not in their vocabulary," according to the daily experience of the patent attorney Cohausz from Duesseldorf.

For this reason, in German and in other European companies, many items are still being invented for the second or third time. Cohausz is amazed again and again to find that "several developers continue to think that the technical literature should be sufficient to accompany their thoughts." If a company does not even have professional accompaniment, such as patent engineers, development work can easily lead to frustration. Patent research started much too late suddenly discloses the debacle—everything already exists.

Corrective action appears urgently needed. Industrial property rights are the only permissible monopoly rights. Such rights include petty patents, design patent and trademarks besides patents. These rights can protect a company's products against domestic and foreign competition in the internal EEC market. They prepare the way for export.

Helge B. Cohausz urgently recommends a change to a more modern line of thought. "It would not hurt if the German companies first risked a temporary application in Germany more often to secure the idea." If the next twelve months show that the idea is economically feasible and can be mastered technically, the company should risk the trip to the European Patent Office. While a European patent is considerably more expensive than a national one, it is still worth the effort. According to the current state of affairs, the protection rights of a European patent extend to 13 countries.

Counter to the general trend of Germans when dealing with patents, several companies have recognized the significance of a European patent. In any case, in 1988, the Germans increased greatly at 23 percent (10,400 applications). They pulled even with the Americans (24 percent, corresponding to 10,600). The Japanese were not so well off at 18.5 percent (8,300). We only need to hope that the German companies in the future treat patents in a more conscientious manner. They also should create the climate where it is fun to be creative.

Patent Applications (in Germany), Compared Internationally

Year of publication	1985	1986	1987	1988	1989	1990
Key technology (selected)						
Germany						
—CIM	270	266	253	326	356	445
—Sensor systems/sensors	1729	1698	1647	1771	1950	2036
—Telecommunications	674	652	631	666	702	743
—Biological process engineering	393	472	550	585	586	540
—Office communications	213	185	181	138	201	161
U.S.						
—CIM	126	179	223	186	262	232
—Sensor systems/sensors	2588	2603	3257	3051	3945	3464
—Telecommunications	895	1055	1483	1371	1689	1645
—Biological process engineering	220	230	326	315	403	402
—Office communications	256	243	262	247	317	360
Japan						
—CIM	3363	2842	4430	4725	4776	4087
—Sensor systems/sensors	14392	16524	16886	18403	18739	17553
—Telecommunications	10552	13398	14423	17099	17575	16661
—Biological process engineering	1443	1675	1674	1976	1868	1950
—Office communications	6108	7345	7993	9228	9142	9460

Source: INPADOC database at STN International/TT Technology Transfer GmbH/Battelle

Databases Described

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[Article by Fr, "The INPADOC Database Combines Over 18 Million Documents"]

[Text] Both the chart and the tabular summary of patent applications in Germany Japan and the U.S. (domestic

applicants) used research in the PATDPA database and the INPADOC database. The German Patent Office and the Technical Information Center, Karlsruhe, offer the former database, and the European Patent Office, Vienna Branch, Patent Information Headquarters offers the latter.

The German Patent Database PATDPA contains the bibliographies of German disclosure forms, patent

classifications, patents and petty patents published in the "Patent Office Journal" of the German Patent Office. It also contains the patents published by the European Patent Office and the World Intellectual Property Organization (WIPO) with Germany specified as the contracting state.

One particular advantage of the PATDPA database is the potential for conducting context searches. The published disclosure forms have provided a summary since 1981. To improve the context search, all words from the titles and summary are also traced by machine to the roots. On the other hand, the most comprehensive patent database in the world is the INPADOC database, having about 18 million patent documents now.

One or more IPC class(es) identifies each individual patent document in these patent databases according to its technological content. During online searches, the documents can be found again using these class(es).

The International Patent Classification (IPC) is a system of ordering. It has about 64,000 classes. This system can differentiate in very fine steps and identify the patents via the scientific-technical context.

STN International (The Scientific & Technical Information Network) offers both databases. STN International is the leading online service for scientific-technical databases. The Technical Information of Karlsruhe, the Chemical Abstracts Service (CAS) in Columbus, Ohio, and the Japan Information Center of Science and Technology (JICST) in Tokyo operate the service jointly.

To determine the numbers, carefully compiled plain text abstractions and the logical combinations of these aided a search through the PATDPA database. This search provided a very large number of patent documents for the five key technologies over several years. Next, these documents were sorted according to the most frequently occurring IPC classes.

Then, a search relation was compiled to query the application numbers in the INPADOC database. This search relation used the IPC classification and the explanations contained there regarding the individual classes and subclasses for the corresponding key technologies. Searches in pertinent literature databases confirmed the context of the search profile.

In the next step, these search profiles queried the INPADOC database for the countries of Germany, U.S. and Japan. This search determined the number of patent applications (restricted to initial publications) for the appropriate domestic applicants. An additional limitation to individual publication years restricts the application numbers from 1985 to 1990. An overview summarizes these numbers.

The searches for determining the application numbers were performed by Jurgen Born, Wolfgang Muller and Annette Wundrich-Zisterer, all employees of TT Technology Transfer GmbH, Association for Information

and Technology Consulting, Heidelberg; with gracious support provided by STN International Karlsruhe.

Sweden: Ericsson President Outlines Strategy For 90's
91AN0399 Chichester INTERNATIONAL
TELECOMMUNICATIONS INTELLIGENCE
in English 15 Apr 91 pp 6-7

[Text] The coming financial year will be one of the toughest for Ericsson, according to the Swedish telecommunications company's president, Lars Ramqvist. Not that sales will suffer, indeed the company is reckoned by most to be riding the crest of a wave so far as order intake is concerned. Ironically, the pressure will come simply because Ericsson has so many new technologies to bring to so many new markets.

Outlining his strategy for the 1990s, Ramqvist told analysts in London last week that 1991 will see a surge in investments in research and development to coincide with the ramping up of volume production of a range of new systems.

Together, systems such as digital cellular systems in Europe, Japan and the U.S., together with increased deliveries of digital wireline systems for private and public networks, wireless PBX (private branch exchange) systems and "network" products, and continuing development and deliveries of older analogue mobile communications technologies will represent a peak effort concentrated in the year. Ramqvist said that in 1990, the company ploughed more than 800 million pounds into R&D, a sum approaching 17 percent of turnover. And of that "some 90 percent was spent on software development."

"But I refuse to compromise the long-term viability of the company for a short-term profit," Ramqvist said. Such heavy expenditure has to be borne if Ericsson is to retain its high ranking in the world's telecommunications league. Fiercely independent, Ramqvist answers critics who believe the company is too small to survive surrounded by merging competitors by claiming a hold on 40 percent of the world's markets for cellular radio systems. "That makes us world leaders," he states and confirms a prediction, made to the same audience a year earlier by his predecessor, Bjorn Svedberg, that "by the year 2000, around 50 percent of the world's one billion telephone users will use mobile communications in one form or another."

But there are setbacks. Ramqvist's most recent disappointment came just a month ago when the European Telecommunications Standards Institute (ETSI) declined to adopt Ericsson's sophisticated CT-3 high-density digital micro-cellular technology as an interim European standard. Worse, they favoured the relatively unsophisticated British second generation cordless telephone (CT-2) standard. However, that was but a temporary defeat "merely a matter of frequency availability." Now, Ericsson is urging ETSI to speed up work on the formal Digital European Cordless Telephone (DECT)

standard. Essentially, that will call for the same narrow-band time-division multiple access system that Ericsson invented for the DCT, but a frequency of 1.9 GHz, rather than 900 MHz.

In the meantime, Ramqvist claims that DCT cordless PABX (private automatic branch exchange) equipment has been "taken by 12 countries." These include Sweden, Norway, Finland, Holland, Germany, Canada, Spain, Italy, Australia, U.S., Switzerland and Taiwan, Ramqvist asserts. Nevertheless, not all of these installations represent revenue, according to observers, and at least one system, that for Spain, is admittedly being "loaned" by Ericsson for the duration of the 1992 Olympic Games. On balance the DCT system must continue to be counted as an R&D item until ETSI finally defines a standard so that the company can revise its technology.

Nearer to the end of its time as a net revenue absorber, are the systems Ericsson is building for the European digital cellular operators. According to a memorandum of understanding signed by 17 European operators, digital cellular services all conforming to the pan-European GSM (Special Mobile Group) standard are scheduled to start commercial operations on July 1st, 1991. "That seems most unlikely," Ramqvist says, pointing out that four of the countries have yet to place orders for equipment, and adding that even if the networks are built, there will be very few, if any, digital telephones to use them.

Ramqvist though is concentrating on the network infrastructure. And he is adamant that "GSM will start to pay back the development costs" very soon. First payback is likely to come from a totally new market for the Swedish firm—Germany. There, two digital network operators, Deutsche Bundespost Telekom and a consortium led by Mannesmann, are racing with each other to the July 1st deadline. Ericsson is prime supplier to the Mannesmann network, and that is the company's "largest undertaking" at present. "We are testing it now," Ramqvist asserts.

Germany is one of Ericsson's major first time conquests. Ramqvist quips: "We have been working to win business in Germany for 115 years" (Ericsson was founded in 1876). Now business there is booming. Orders have been won for public and private systems, starting with digital PBX network sales to a number of private corporations, digital cross connect apparatus to the Bundespost and winning the Mannesmann digital cellular contract.

The U.S., too, seems to be rewarding Ericsson's stubborn refusal to give up on a targetted market. Major success in 1990 was the closing of a deal for cellular networks with McCaw Cellular Communications Ltd, the U.S.'s largest operator. That sale was worth \$172 million, and now Ramqvist can count a total 400,000 cellular subscriber lines in service in the U.S.. Five years' persistence with wireline products in the U.S. have also come near to bearing fruit as the AXE digital switch has finally been

qualified by four of the seven Regional Bell Holding Companies as a contender for their business. However, as one observer points out, being allowed to pitch for business does not necessarily guarantee that orders will result.

However, behind the Swedish realism, Ramqvist's prognosis for the next 10 years is unbounded optimism. Present products are enjoying continued success, the next generation is about to bear fruit and there is money to commit to the development of whatever is needed next. Moreover, Ramqvist has refined his views of what markets will require and redefined and organised the management structure needed to take best advantage.

Doggedly determined that Ericsson will retain its independence, Ramqvist has dubbed the next 10 years as the decade of "Personal Communications"—based on network management and digital switching systems, all supporting a range of personal mobile communications products.

"It will be the age when people will want to talk to other people, and not call empty rooms," he says.

British Telecom Chairman on Market Deregulation

91AN0356 Paris *ENTREPRISES & TELECOMMUNICATIONS* in French Apr-May 91 pp 72-75

[Interview with British Telecom Chairman Iain Vallance by Herve Marchal: "In the Winds of Hypercompetition"; first paragraph is *ENTREPRISES & TELECOMMUNICATIONS* introduction]

[Text] The modern saga of British Telecom (BT) is, in fact, a true return to the roots. First the United Kingdom, then the rest of the world—with only one boss: the customer. But in no event should its chairman, Iain Vallance, a charismatic liberal figure of English society, be regarded as a theatrical director. On the contrary, he is a decisionmaker. He is the man who is implementing a painful, internal restructuring which will result in the departure of 45,000 employees. He is the man who crosses swords with the Office of Telecommunications (OFTEL) defending his corporation's clear-cut dominance in the national market. He is the man who is at the helm of Tymnet, drawn by the wind of the high seas, off to conquer the "market of the future": value-added services for the large multinationals. He is the man who is ready to invade the mobile communications market. Finally, he is the man who claims his country to be the most liberal in the world. An exclusive interview with Iain Vallance.

ENTREPRISES & TELECOMMUNICATIONS: The government has recently put an end to the duopoly of British Telecom and Mercury, who until then had been sharing the British telecommunications network between them. This change is all the more important since your company controls approximately 95 percent

of the market. Moreover, the bitter dispute which preceded this decision—and in particular your sharp confrontation with OFTEL—illustrated the extent to which this change in the law disturbed you. In the end, you appear rather satisfied with the measures taken by Peter Lilley, the Minister of Industry responsible for this matter. Thus, we can conclude that you have received substantial concessions for this....

Vallance: Let me say first that we have just taken a decisive step in the important process that began in 1984 with the privatization of our company. Today, we have reached what I call the watershed. The step we have taken is an essential one: We went from a government-controlled to a real competitive market. It is tough for us, but also for our competitors.

ENTREPRISES & TELECOMMUNICATIONS: Consequently, this new situation is the result of an agreement negotiated with the government.

Vallance: The agreement that we came to with OFTEL and the government covers many subjects. However, four points seem essential to me. First, it concerns the possibility of altering rate structures. This means that if we want them to be commensurate with the actual cost, which is our objective, fixed fees (connection and subscription) have to increase and variable fees (calls) be reduced. Second, we adopted the principle of a flexible rate structure. This gives us the right to offer more advantageous "package deals" to large customers. Our rate structure will no longer be rectilinear; this allows us to improve our position toward large accounts. The third point deals with the fees for interconnection, which will henceforth be shared, as of now with Mercury and in the near future with others. This means that those who connect to and use part of our network will have to pay a fair price to move all or part of their traffic. It is one way of acknowledging that other long-distance carriers must do their part in rebalancing the deficit generated by the cost of the local network. In fact, this does away with a subsidy for newcomers. Fourthly and finally, from now on international calls will be a part of the revised rate structure. This is important since the new regulation requires rates to be based on the rate of inflation minus 6.25 percent. Therefore, with international traffic in the price basket, we write off the reduction on 65 percent of our income rather than on 55 percent. This is easier to absorb. After all, we are reasonably convinced that this is an arrangement we can live with; all the more so since newcomers will have to prove themselves.

ENTREPRISES & TELECOMMUNICATIONS: Two areas remain in which you did not obtain satisfaction—cable and mobile communications.

Vallance: It is true that we are disappointed with the restrictions on mobile communications; and, particularly, with the ban on transmitting television pictures over our network. This latter point hits closer to home since it brings into question the principle of reciprocity between us and the Regional Bell Operating Companies

(RBOC), the American regional telephone companies. In reality, they are liberally permitted to introduce cable into Britain. We, however, encounter significant restrictions in the majority of areas in the United States. It is due to this that I demand the same freedom in the American market.

ENTREPRISES & TELECOMMUNICATIONS: In reality, do you believe England to be the most advanced country now in terms of deregulation?

Vallance: Yes, certainly. Competition is much freer here than in the United States or anywhere else in the world. All the more so if the government continues as it announced in its White Paper. We tend to forget that in the United States the RBOCs have a local monopoly. There is real competition only with respect to intercity and international traffic, and to a limited extent in mobile communications. In England, it is everywhere.

ENTREPRISES & TELECOMMUNICATIONS: You are conducting a vast internal restructuring program which could result in 30,000 redundancies. As justification for this, some people readily mention that the productivity of France Telecom is higher than yours.

Vallance: It is hard to compare the two companies since we do things that France Telecom does not do, and vice versa. Having said that, it is clear that, among the Europeans, France Telecom is the most competent and efficient. As for our restructuring, the primary objective is to overhaul our approach toward customers. It is a matter of putting the customer first.

For example, take two houses in the same neighborhood. In one of them lives a journalist who works at home; he needs a fax, a hands-free telephone, and maybe a leased line or a connection to an integrated services digital network (ISDN). In the other house lives an elderly woman; she is waiting for a telephone with large push buttons. In a geographical approach (which we had previously), these two people would be offered the same equipment even though they do not have the same needs at all. Henceforth, we shall be responsive to this type of situation.

However, one of the consequences of our restructuring will indeed be a reduction in manpower. You say 30,000? It all depends upon the time period under consideration. During the last 12 months, some 15,000 people were laid off. The plan for the next two to three years is for 10,000 per year. At the same time, our endeavors to modernize the network continue at the rate of 8 million pounds per working day. Each day, we install two digital exchanges. We are mainly using equipment supplied by GEC-Plessey Telecommunications (System X) and Ericsson (AXE 10). Today, almost 10 million lines have been digitized, i.e., about 40 percent of the network. This program will continue into 1995.

ENTREPRISES & TELECOMMUNICATIONS: The Telepoint system—a pocket-size phone which permits

telephoning in the street close to a relay terminal—is a failure. Is this a major setback for you strategically?

Vallance: Technically, Telepoint functions very well. However, there is a marketing problem, which is being studied. The operators' offer is being modified; they are currently in a process of amalgamation. Anyway, Telepoint does not represent an essential activity for British Telecom.

ENTREPRISES & TELECOMMUNICATIONS: Do you have faith in the Personal Communications Network (PCN), the individual telecommunications network of the future, from which you were excluded by the government?

Vallance: In the first place, it all depends upon what you mean by PCN, since this is multifaceted concept. In any case, I maintain that it does not exist at this moment. If it is true that the government has allocated frequencies in the 1.8-gigahertz range, we are convinced that we can offer exactly the same service in cellular form, in the 900-megahertz band. We did not receive the PCN license on 1.8 gigahertz so as to allow new players, new competitors to enter the field. However, this does not bother us very much. We are convinced that, by developing our cellular network on 900 megahertz, we shall be able to meet all market demands in personal communications.

In reality, what is PCN? Personal communications. A stage, that is all. In this matter, there exists a kind of word magic. So, let us keep it simple. Besides, if Cable and Wireless¹ is not offering anything yet, it is because there is no demand in the marketplace. Let us take an example. Are you convinced that today's clientele is really demanding the ability to turn off the lights at their house or to activate the closing of their shutters by means of their telephone? I am saying that, in my opinion, this has yet to be shown.

ENTREPRISES & TELECOMMUNICATIONS: Will the market for communications by satellite using VSAT (very small aperture terminals) microstations experience a large expansion? Will your cooperation with Hughes in this area increase?

Vallance: Our cooperation with Hughes (Satstar is our banner result) is a business participation. In reality, they have equipment that is well adapted to this type of service. And it is true that, considering the very positive easing of restrictions in the space sector, VSAT represents a good solution for corporate communications.

ENTREPRISES & TELECOMMUNICATIONS: Let us stay in space for a moment. Do you consider Motorola's Iridium project viable (77 satellites orbiting the earth to create a network completely independent from Post and Telecommunications Authorities (PTTs)?

Vallance: That is a particularly interesting project, which is why we started discussions with Motorola in the spring of 1990. However, we cannot kid ourselves; this is not for tomorrow. Among others things, there are many

technical problems, and maybe even more regulatory ones, which have to be resolved.

ENTREPRISES & TELECOMMUNICATIONS: Your policy is to extricate yourself from your industrial investments—Mitel in Canada, for example. Are you not tempted, however, to offer an integrated package of services and hardware like the American giant AT&T?

Vallance: No, absolutely not. We tried to diversify in the manner you mentioned, but we gave it up. We hold 51 percent of the shares in Mitel and as soon as there is an opportunity to sell, we would seize it. However, that would depend upon the price. Mitel is purely a financial investment to the extent that, as I just mentioned, production of private automatic branch exchanges (PABX) is no longer in our strategic plans. We even see a basic contradiction in being both a manufacturer and a supplier of services. It is not easy for a manufacturer to sell his hardware to operators who are, most often, his main competitors. On that point, we have a much different attitude from that of AT&T. Finally, I do not believe that the "smart" PABX is any longer at the center of all telecommunications. We can do just as well with a "basic" PABX, but with a "smart" network.

ENTREPRISES & TELECOMMUNICATIONS: With respect to large customers and small and medium-sized enterprises (SMEs), demand for telecommunication services by these companies keeps increasing. How are you responding to this demand?

Vallance: The first thing that very large international companies expect is to have a sole supplier for all of their service requirements. Our intention for the future is to meet all these requirements that are vital to users on a case by case basis. Thus, on the floor of the stock exchanges, it is necessary to guarantee 100 percent dependability and quality. This is obviously more expensive, but these clients are willing to pay more for this type of service. In other areas, most would be content with 90 percent. The essential thing is to respond to demand; create the service to fit the need. However, to achieve this, you have to have analyzed and fully understood what type of operation the client has.

ENTREPRISES & TELECOMMUNICATIONS: Exactly; for large enterprises, is your worldwide offer going to focus on value-added services, known as Global Network Services (GNS), based on the Tymnet system, which was reacquired from McDonnell-Douglas in 1989?

Vallance: British Telecom's offer of GNS through Tymnet consists of a worldwide value-added services network which is accessible from 90 percent of the world's primary business centers and from more than 100 countries. We supply three sorts of value-added services: First, so-called "all-in" services in 22 countries (we take care of all the activities and the client does not have to worry about anything); second, value-added services in more than 35 countries (this is also an "all-in"

value-added service but offered through local telecommunications operators); third, an X75 access in more than 80 countries (packet-switched data transfers along interconnected national networks). With the launching of GNS, British Telecom is managing the largest operational value-added network in the world today.

This allows BT, in its role of sole supplier, to offer its customers services they were demanding, but which were nonexistent at the time. Among other things, this includes centralized billing in the currency chosen by the client, personalized network management services, and "all-in" maintenance. This enables our customers to concentrate on their areas of predilection, their business, while GNS takes care of difficult and complex problems tied to international communications.

ENTREPRISES & TELECOMMUNICATIONS: Taking into account British Telecom's experience, objectives, and abilities, how does your company regard the future with respect to corporate services? What sort of demand do you anticipate for the business world?

Vallance: Basically, that depends on the size of the companies. The aim of our aforementioned internal reorganization was to allow us to respond to the different needs of assorted customers. The rule is "be flexible." As a supplier, we must listen to the customer and not try to impose our own point of view. Nonetheless, we believe that there are more and more customers who want a package solution. That implies a one-stop-shopping service, where there is one representative for all services and, with respect to the large corporations, global network solutions.

For some time now, we have had to face up to growing pressure from the global market which demands a sole supplier for "all-in" value-added services including voice, data, video, or fax services. Multinationals want to entrust one prime contractor with the entire responsibility for establishing a personalized, global solution. This trend toward "outsourcing" (offering customers an "all-in" package deal by procuring products that are not in the catalog from other suppliers), is gaining impetus at the international level.

ENTREPRISES & TELECOMMUNICATIONS: Are all operators prepared to respond to this expectation?

Vallance: Today, not one telecommunications supplier can provide a complete product range, since this would actually imply the operation, maintenance, and marketing of a network on a worldwide scale. It is for this reason that the majority of international services are offered through traditional agreements made with national telecommunications operators. However, quite original moves are under way. For example, that is the case with the "Account Management Plus" service, provided jointly by AT&T, the Japanese KDD, and BT. This one-stop service was established outside of traditional arrangements.

ENTREPRISES & TELECOMMUNICATIONS: It is evident that operators are attracted by the international market, that is where the largest profits can be made. Nevertheless, the FINANCIAL TIMES is leading a very active campaign against prices, which they consider too high for international communications. Our colleague does not hesitate to denounce a sort of international cartel among large operators.

Vallance: Telecommunications operators have always made more money with intercity and international traffic than with local communications. It is indeed true that we—and we are not the only one—make substantial profits on international traffic, on the order of 2 billion pounds per year. Why? First of all, because it allows us to compensate for the low local rates. Moreover, the higher charge for an international communication is obviously less unpopular than a more expensive local subscription. Finally, in the medium term, increased competition is going to result in lower charges for the consumer. And I can assure you the reductions will be significant.

ENTREPRISES & TELECOMMUNICATIONS: Aren't you announcing a reduction in rates as of today?

Vallance: This is what is going to happen now. Local enquiry services will have to be paid for, but in return we will go ahead with an average rate reduction of 4.5 percent. For intercity services, this reduction will be 7.3 percent. As to international calls, the price will come down by 0.5 percent as of April, and by 10 percent in June. Overall, this trend will not only continue, but accelerate.

ENTREPRISES & TELECOMMUNICATIONS: Exactly, do you believe that competition in Europe is going to become more pronounced? More than a year ago you stated that "the privatization bug will reach all of Europe." You even added that "the wall of the telecommunications monopoly is going to come down, just like the Berlin Wall." Deregulation has progressed on the Continent and, nevertheless, BT does not show the same aggressive behavior as in the American market.

Vallance: I am convinced that liberalization and competition are going to increase significantly. Inevitably, politicians and regulatory bodies will have to authorize what the market demands and technology can supply. It is true that we have been more aggressive in the American market; however, the explanation is quite simple: It is more open than the majority of the European markets. Competition in Europe is very limited, today.

ENTREPRISES & TELECOMMUNICATIONS: In your opinion, have France and Germany deregulated enough, and in a comparable way? Are there not portions of the market which could be even more open?

Vallance: To be sure I would like to see the French and German markets as open as the British market, but this is obviously not yet the case; in particular, with respect to basic telephone services. Nonetheless, I have the

feeling that Germany is heading more rapidly toward a policy of deregulation than France.

ENTREPRISES & TELECOMMUNICATIONS: What exactly is the significance of your presence in France?

Vallance: The competition level of the market is very limited. Nevertheless, we are developing close cooperation with France Telecom, especially in the fields of switching and international dedicated services. In addition, we have a small-scale operation there, which is limited to offering Tymnet, and we are really successful in selling systems for the floors of the stock exchanges.

ENTREPRISES & TELECOMMUNICATIONS: How are you going to expand your operations in Europe?

Vallance: We shall be competing in all areas where competition is allowed, particularly in that of data transmission. With this in mind, Tymnet represents a key acquisition for British Telecom. When regulations permit it, we shall begin competing for the operation of the networks of the large international companies.

We are quite interested in mobile communications, but the opportunities are very limited. I see us more in a role of cooperation, than in competition. Here are two examples: In Poland we had a 20-percent stake in a consortium led by Swedish Telecom. However, a law nullified everything. The new call for tenders has just been issued, but we do not know if we are going to respond. In Portugal, we have entered into a partnership with a local private company, Compta, to develop the GSM [Special Mobile Group] mobile telecommunications standard. This will be the first pan-European cellular network available in Portugal. However, this does not seem to be the moment for us to begin competing in the area of fixed networks. Participating in a Central European network, as France Telecom decided to do in Mexico with Telmex, for example, is out of the question.

ENTREPRISES & TELECOMMUNICATIONS: In comparison, your investments in the United States are sizable and impressive: a 20-percent stake in McCaw Cellular, for which you are criticized for having paid too much, and the acquisition of Tymnet. Nonetheless, you have terminated your paging operations.

Vallance: This was a minor activity which did not offer great prospects. On the contrary, the Tymnet acquisition has been a great success. There is still McCaw, which we have always regarded as a long-term investment that will improve. At present, cellular phone business is slowing down in the United States because of the general recession, but we are convinced that it is still going to be a big success in that country.

ENTREPRISES & TELECOMMUNICATIONS: In recent months there has been a great deal of discussion about your connections with IBM, particularly concerning your supplying large enterprises with full-service

communications. Even more now that Big Blue has decided to transfer its worldwide telecommunications headquarters to London.

Vallance: In 1984, there was a joint venture project bearing the name JOVE. However, because of the Monopolies Law, the government forbade it. It is true that we have important ties with IBM. We are one of its principal customers, and vice versa. I can assure you, however, that no joint venture project exists. Obviously, if we can do more business with IBM, we shall do so.

ENTREPRISES & TELECOMMUNICATIONS: In your opinion, what are IBM's plans in the telecommunications field?

Vallance: Operating a basic network is not part of IBM's strategy; however, providing network services to its clients certainly is.

ENTREPRISES & TELECOMMUNICATIONS: So it enters into direct competition with BT in this market.

Vallance: Our relationship is really quite complex. However, the same is true with AT&T. We work together with these two companies and we compete with them. We are possibly the main customer of IBM in Europe and IBM is our main customer in Great Britain. The situation with AT&T is much the same. Competition is focused on precise, limited portions of the market. Honestly, all of this is quite complicated.

ENTREPRISES & TELECOMMUNICATIONS: What about your relationship with Northern Telecom?

Vallance: For us, it is a major supplier of PABX systems with its "Meridian" range. Every time we have to install a private network, we shall use Northern Telecom's PABXs anywhere in the world. Therefore, we have good relations. However, Northern Telecom is not our major supplier of exchanges for public networks.

ENTREPRISES & TELECOMMUNICATIONS: Last but not least, what is British Telecom's overall strategy?

Vallance: Great Britain is still the place where we have to carry on our main business, where we have to achieve success on a priority basis. If we want to be successful anywhere else, we must win in Great Britain first.

Our international strategy, is focused on North America, West Europe, Japan, and a portion of the Pacific. In terms of business sectors, it is directed toward mobile communications services, data transmission, and private international networks for large multinationals.

ENTREPRISES & TELECOMMUNICATIONS: How do you see the telecom scene in 10 years, and with which performers in the forefront?

Vallance: Major changes will take place. Only five or six companies will be capable of offering worldwide services. To a certain degree, the others will be forced inside and they will have to concentrate on supplying services

at the national level, which, by the way, does not seem very exciting to me. Well then, who will be these five or six lucky ones? The American companies AT&T, for sure, and IBM or General Motors-EDS; the Japanese companies KDD and NTT; and finally, one or two Europeans: British Telecom, Bundespost Telekom, or France Telecom. All the other companies will be eliminated by two factors: on the one hand, the cost of research and development—the entry fee at this level will be approximately 200 million pounds per year, i.e., Fr2 billion—and, on the other, the necessity of a real international operation as the bulk of the future market will be made up of multinational companies. Tymnet has given us this international dimension. As a final example, note that in Great Britain these companies make over 50 percent of their income abroad. Thus, there is no question of not providing our services in Bangkok, Sydney, or Osaka.

[Box, p 75]

Third Largest Company in the UK

Privatized at the end of 1984, British Telecom has 1.2 million private shareholders, who hold 3 billion shares, i.e., 51 percent of the capital. The shareholdings of the small holders, including BT employees, represent 20 percent of this package. The State still controls 49 percent of the company. Today, BT is the third-largest company in the United Kingdom in terms of sales figure, the first company in terms of profit, and the country's largest employer with 240,000 employees. Its 1990 turnover reached 12,315 million pounds (fiscal year March 1989-February 1990), with pretax profits of 2,302 billion pounds. During the last nine months of the current fiscal year, as compared with the same period of the previous year, turnover increased by 7.9 percent and profits by 15.5 percent. As the principal operator of private telecommunications in Europe, and second in the world, British Telecom has recently implemented a new internal organization. Iain Vallance replaced the geographic distribution with a three-sector approach that is better adapted to the customer: "business communications" for the companies; "personal communications" for the public at large; and "special communications" for all other activities, including mobile phones.

Footnote

1. British telecommunications operator specializing in international lines, with a strong presence in Asia, more particularly in Hong Kong. It has a staff of nearly 30,000 people.

EAST-WEST RELATIONS

Pan-European Academic Research Network Planned

91AN0369 Amsterdam COMPUTABLE in Dutch
5 Apr 91 p 14

[Text] The Hague—Two years from now, East European universities and research centers will be able to exchange

knowledge and information with their West European counterparts via the international European academic research network.

This is the objective of the Unicom (Universities Communications Network) project, that is being conducted by several European organizations. Although most East European universities do have computer equipment at their disposal, they are lacking appropriate computer communications, says a spokeswoman of the Dutch Ministry of Education and Sciences. Participants in Unicom include the UNESCO's European Center for Advanced Education (CEPES) in Bucharest, the Dutch Catholic University Brabant (KUB), and the German Ministry of Education in Bonn. The UNESCO's CEPES center will ultimately be responsible for interconnecting East European universities and research centers to the academic network. CEPES has contact organizations in all East and West European countries.

In the meantime, a temporary solution exists for communications between East and West via the Catholic University Brabant (KUB). In the near future, the KUB will function as a relay station between West European national academic networks and the CEPES contact organizations in East Europe. This will be done using SURFNET, the Dutch communications and information services network for universities, institutes of higher learning, and research centers. Currently, the KUB is also providing services for institutes of higher learning that do not have their own electronic communications facilities, and it is developing project proposals within the scope of Unicom, such as training projects for system designers for example, and the establishment of a computer center in Bucharest, which is indispensable to the success of Unicom.

The Dutch Government has allocated 1.25 million guilders to the Unicom project, which will be spent on network interconnection equipment and on training of staff in East Europe. This amount will also cover the operational costs for the first three years. The money has been taken from the budget of the Dutch Support Program for East Europe, which is managed by the Ministry of Economic Affairs.

In addition to the Netherlands, other countries have also offered their support to Unicom. The Soviet Union has agreed to make satellite space available, while the Paris branch of UNESCO has arranged that the Bucharest office of CEPES will be able to operate on neutral territory.

EC Commissioner Bangemann Calls for COCOM Relaxation

91AN0347 Amsterdam COMPUTABLE in Dutch
22 Mar 91 p 19

[Article by Nigel Tutt: "Commissioner Bangemann Calls for COCOM Relaxation—'Remove Differences Among EC Countries'"]

[Text] Brussels—Martin Bangemann, member of the European Commission responsible for industry and the internal market, strongly advocates the relaxation of the COCOM regulations that restrict export of high-technology products to Eastern and Central Europe. This step is in line with Bangemann's industrial policy.

Bangemann's strategy is laid down in a report prepared by his staff which outlines his priorities for 1991. In addition, the report focuses on standards development and the abolishment of barriers between the 12 EC member states with a view to the eventual establishment of a common market.

Bangemann: "The establishment of the internal market will also require the harmonization of the numerous and divergent export regulations of all the member states."

"A major obstacle to this harmonisation is article 223 of the EC regulations," he continues. That article stipulates the right of every member state to enact restricting export regulations.

The Commissioner also proposes to discuss the amendment of Article 223, together with the COCOM aspects included in it, within the scope of ongoing negotiations on political union. Furthermore, he wants to attract "political attention to the simplification of COCOM regulations."

Bangemann also seeks to abolish the use of temporary restrictions on imports from one member state into another. Article 115, which allows the fixing of quotas, is frequently used by France and Italy to prevent electronic consumer products from being sneaked in from the Far East via other EC member states.

As far as royalties on intercountry satellite and cable networks are concerned, Bangemann intends to present a plan by mid-1991 that would lessen differences between various countries. During the summer, Bangemann will be working on the preparation of detailed proposals in the area of data networks allowing cooperation among police forces, tax services, and animal husbandry inspectors.

France, USSR Sign Scientific Cooperation Protocol

91AN0360 Paris *RECHERCHE TECHNOLOGIE*
in French Mar 91 p 8

[Text] At the close of his visit to France from 3 to 8 February, Nikolai Laverov, member of the USSR's Academy of Sciences and minister of education, signed a cooperation protocol between the [French] Ministry of Research and Technology and the Soviet State Committee for Science and Technology. This cooperation protocol, which will be in effect for five years and is renewable, allows the USSR to learn French methods of planning, managing, and evaluating scientific policy. In order to allow rapid implementation, meetings will be held in Moscow and Paris in 1991, and a Forum on

Exportable Soviet High Technology will be organized at the French Foreign Trade Center next April by the French-Soviet Chamber of Commerce and the State Committee for Science and Technology. This forum will be sponsored by Pierre Beregovoy [Minister of Economy, Finance, and Budget], Hubert Curien [Minister of Research and Technology], and Nikolai Laverov.

Among the general areas of cooperation that the Soviets envisage are: research on environmental protection (including the international Global Change program); nuclear reactor safety and radioactive waste storage; major medical research projects, notably on the human genome; earth observation; space research; and the exchange of experience in regard to legislation.

During his stay in France, Nikolai Laverov had talks with Laurent Fabius, president of the National Assembly; Yves le Deaut, president of the Parliamentary Office for Scientific and Technological Risk Evaluation; and with members of the Academy of Sciences and officials of French public research organizations.

French Computer Firm's Subsidiary Recruits Polish Experts

91WS0259A Paris *LE MONDE* in French 13 Mar 91
p 31

[Article by Marie-Claude Betbeder: "Polish-Style Partnership in Computing"; first paragraph is *LE MONDE* introduction]

[Text] The young computer service firm, Ixel, has established a Warsaw subsidiary that plans to recruit 500 specialists in five years.

France and Western Europe are sorely lacking in computer engineers. This shortage drains the computer capabilities of less advanced nations. The "brains" emigrate and are put to work by companies in the developed countries that employ them to do their excess work.

This process threatens to accelerate between the two halves of Europe in the coming years. It could cost Poland one of its biggest advantages: its exceptional potential in high-level computer scientists. Ixel, a young software and electronic engineering firm in the Hauts-de-Seine Department, is trying to match its own development to that of the countries where it becomes established.

Ixel has established a Warsaw subsidiary, Polixel, which plans to hire 500 computer engineers in 5 years. By 1995, four-fifths of this group should be providing software services and consulting for the Polish market. The other engineers will be writing software programs and packages for the French market from Poland.

The operation's promoters, Xavier Luyten and Jacob Nuta, are clear on its advantages for them. On the one hand, it will allow them remedy the shortage of engineers that is forcing them to turn down more and more work in

France. On the other, they will have a presence in a country that is wide open in their specialty and from which they can hope to exert their influence on Central and Eastern Europe.

Own Capabilities

As for Poland, it will develop its own capabilities in a high tech field allowing it to satisfy its own requirements and export high value-added activities. The establishment of a high-level computing operation in the heart of the country will help to keep engineers tempted by emigration at home.

This desire for equilibrium can be seen in the balancing of the respective contributions. Almost 50 percent of Polixel is held by Polish shareholders, including the important Association of Polish Computer Scientists (PTI). In addition, although Ixel does bring high-level theoretical knowledge, it will be teaching them to use it in viable economic projects. Each engineer hired will receive six months' training. He will be introduced to the realities of capitalist business and to "project development methodology in computer science" before breaking in his knowledge on practical work.

Polixel and PTI are developing a true partnership. The association participated in the development of the training program. It will monitor its quality regularly and will advise on the choice of instructors (who will be French only in the beginning and as dictated by requirements). It is also conferring its label on the diploma given. When the five years of the program are over, it will be considered the owner of all of the tools used in training. This training may be given at universities and engineering schools in Poland. A first group of around 20 people is preparing to start up. It will be followed by groups of around 50 every six months.

Ixel sought and found financial support to cover the investment. "Everyone considers this an excellent project," according to Claude Francois, secretary-general of the Franco-Polish chamber of commerce. Profitability is already guaranteed: "Polish needs are tremendous," the firm's heads said, "and we are closing new deals every day." They are studying another project in Tunisia—another country rich in human potential and unexploited technical resources.

France's TES Targets East European Waste Treatment Market

91WS0306A Paris L'USINE NOUVELLE in French
7 Mar 91 p 44

[Article by Philippe Andreani: "TES Burns for East Europe"; first paragraph is L'USINE NOUVELLE introduction]

[Text] Following its success in Czechoslovakia, TES, a specialist in the treatment of waste and sewage, is pursuing its offensive in East Europe. Its goal: to make 40 percent of its sales there.

While many people talk about it, Antoine Andraos is settling in. The president and general director of TES, a French manufacturer of installations for the incineration, crushing, and composting of waste and the purification of sewage, has just won a contract for 22 million French francs [Fr] with an East European country. The contract concerns two (nontoxic) waste incinerators—that will be delivered in the fall of 1991—for the Usti region in Czechoslovakia.

"The near 'duopoly' in France of the General Water Company and the Lyon Water Company in our sector forces us to adopt an export expansion strategy," remarks the CEO [chief executive officer] of the small, 20-person company located in Roanne (Loire). So he plans within the next two years to make 40 percent of his sales (expected to be Fr120 million in 1990) on the other side of the former Iron Curtain, because of those markets' potential for expansion in the realm of environmental services. As it happens, the Usti region is one of the most polluted in Europe.

Yet the deal was far from assured. As Dominique Delahouille, administrator and mission head at TES, explains, "after the purchase last July of the assets of the Frapy Company—which, after it filed for bankruptcy, was unable to honor the contract—we had to regain the confidence of the Czechoslovaks in order to resume discussions." The small Roanne company therefore promised to stay within the cost estimates and timetable initially set by Frapy.

It was worth it. This first contract opens up bright prospects for TES, which is actively seeking contracts in the Bulgarian, Polish, and Soviet markets. Indeed, Czechoslovakia is, together with the ex-GDR, the official Comecon supplier of machine tools to Soviet industry.

TES also wants to grow in southern Europe, notably in Spain, through projects for "green" thermal power plants. A contract estimated to be worth Fr180 million is moving in the right direction: the sine qua non condition for Antoine Andraos to attain his objective, which is to make over half of his sales in foreign markets.

Siemens To Acquire Controlling Interest in Hungarian Telephone Factory

91WS0254a Budapest COMPUTERWORLD/
SZAMITASTECHNIKA in Hungarian 14 Feb 91 p 1

[Article by Peter Sz.-Szalay: "The Telephone Factory and the Siemens Empire"]

[Text] The Telephone Factory [Telefongyar] and the other winner, Siemens AG, of the famous (infamous?) telephone exchange tender, and their joint enterprise Dunatel Ltd., held a press conference. (We wrote about the parallel plans of Ericsson and Instrument Technology [Muszertechnika] in issue No 5, 1991, of COMPUTERWORLD/SZAMITASTECHNIKA.)

The 150 year old Siemens, which is present in 120 countries of the world—as a manufacturer in the majority of them—and which did 67.5 billion marks in business last year, is trying to get majority ownership of the 115 year old Telephone Factory. According to the ideas Siemens cooperation at the Hungarian enterprise will involve more than manufacture of the EWSD telephone exchanges. According to the plans the entire production organization will be integrated into the international enterprise empire; it will participate in the division of labor as a member thereof with equal rights and will also compete with its sister enterprises.

The Telephone Factory is tied to Siemens, present in our country for a hundred years, by decades of good contacts—despite protests and obstacles. So the preparations for privatization, the purification of profile and the creation of an economic balance associated with the name of the director general, Martos Gabor Beke, fit well into the German thinking.

Siemens will manufacture in Hungary all types of telephone equipment in the broadest sense. This includes, in addition to the EWSD digital exchange already mentioned, private exchanges and data transmission systems, telex, cable technology, multilayer printed circuits, telephone sets and software. According to the preliminary plans there will be work for 1,600 of the current 1,800 workers of the Telephone Factory.

As for realization of the grandiose privatization plan, well, the first steps must be taken with the Property Agency. The parties involved have faith that the representatives of the state will conduct the transaction with swift and professional action, making it possible for the 50 million marks of Siemens—already on deposit in Hungary—to be activated as soon as possible. The delivery of manufacturing equipment and preparations

for manufacture could then begin. This year's obligation of the enterprise, 26,000 telephone lines, for Cegled, Albertirsa, Nagykoros and Vac, will come from Germany, but domestic experts will participate in setting up the exchanges and preparing the software. Otherwise their chief task this year will be to study. The undertaking, worth 100 million marks (the share brought in by the Telephone Factory is evaluated at 50 million marks as well), will spend 90 million forints on training this year.

The economic plans for the new Siemens factory to be established are imposing. By 1992 they expect a production value of 4.2 billion forints and by the middle of the decade they hope to increase this to 10 billion—naturally taking into consideration the entire product structure of the enterprise. Export also plays an important role in their thinking. This year they will ship 80 million schillings worth of printed circuit sheets to the Austrian plant of Siemens. This deal already indicates that there are great possibilities for cooperation “within the empire.” Within three years they may be exporting digital exchanges as well.

The EWSD exchange is one of a few digital systems proven on the international market. It was developed about 10 years ago—even today 2,500 engineers in Germany are working on further development of it—and so far 30 million lines in 47 countries are operated with these exchanges. So our country is the 48th in this line. How many of the innumerable services of it subscribers will be able to enjoy depends on a decision by the Telecommunications Enterprise. It seems probable that these exchanges—together with the Ericsson equipment—will soon cover the country and then we, the subscribers, will be getting more and more of the services.

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